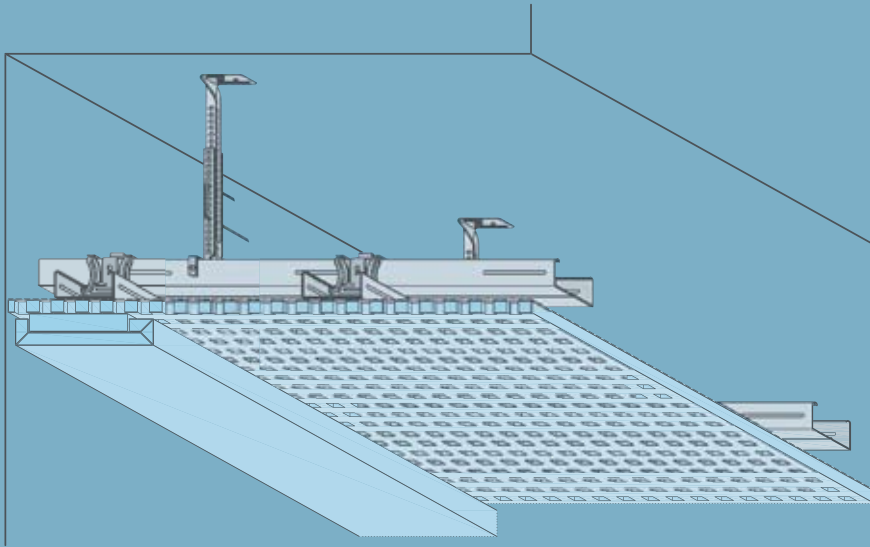


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D12 Knauf Cleaneo Acoustic Ceilings

D127 – Knauf Cleaneo Acoustic Design Ceiling

D124 – Knauf Cleaneo Acoustic Fire Protection Ceiling

The structural, statical properties, and characteristic building physics of Knauf systems can solely be ensured with the exclusive use of Knauf system components, or other products expressly recommended by Knauf.

D12 Knauf Cleaneo Acoustic Ceilings

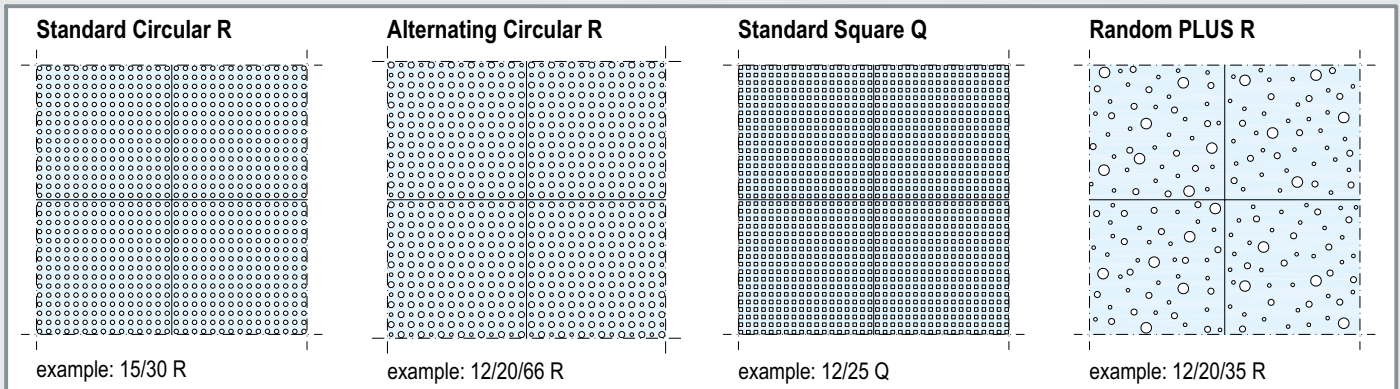
Perforation Design: Continuous Perforation / Block Slots "slotline"



Continuous perforation

scheme drawings, face side

Design	Perforation	Perforation ratio (board) %	Board dimensions (standard size)		Spacing of furring channel b mm	Edge type 4SK
			width mm	length mm		
Standard Circular R	6/18 R	8.7	1188	1998	333	●
	8/18 R	15.5	1188	1998	333	●
	10/23 R	14.8	1196	2001	333.5	●
	12/25 R	18.1	1200	2000	333.3	●
	15/30 R	19.6	1200	1980	330	●
Alternating Circular R	8/12/50 R	13.1	1200	2000	333.3	●
	12/20/66 R	19.6	1188	1980	330	●
Standard Square Q	8/18 Q	19.8	1188	1998	333	●
	12/25 Q	23.0	1200	2000	333.3	●
Random PLUS R	8/15/20 R	9.9	1200	1875 oder 2500	312.5	●
	12/20/35 R	9.8	1200		312.5	●

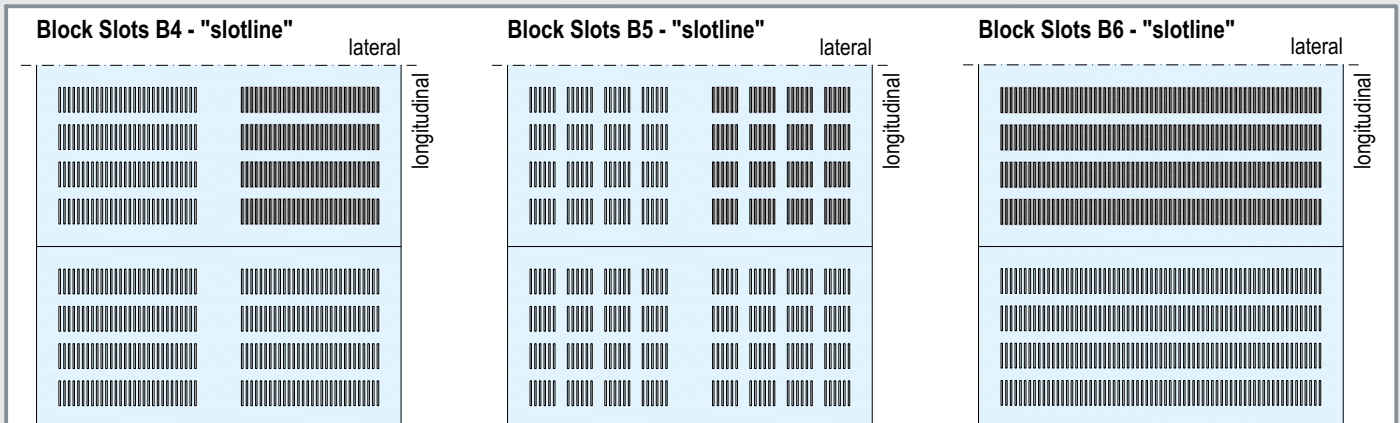


Block Slots "slotline"

Perimeter dimensions are optical specifications (see page 4)

scheme drawings, face side

Design	Slots per "block"		Perimeter non-slotted		Slot ratio (board) %	Board dimensions (standard size)		Spacing of furring channel b mm	Edge type		
	lateral	longi- tudinal	lateral mm	longitud. mm		width mm	length mm		HRK SFK	4SK	4AK
B4 - "slotline"	30	4	73.9	73.3	13.7	1200	2400	300	●	●	●
B5 - "slotline"	4x 6	4	73.9	73.3	10.9	1200	2400	300	●	●	●
B6 - "slotline"	69	4	73.9	73.3	15.7	1200	2400	300	●	●	●



- Slots are only possible in longitudinal direction of Knauf Cleaneo Acoustic Boards

D12 Knauf Cleaneo Acoustic Ceilings

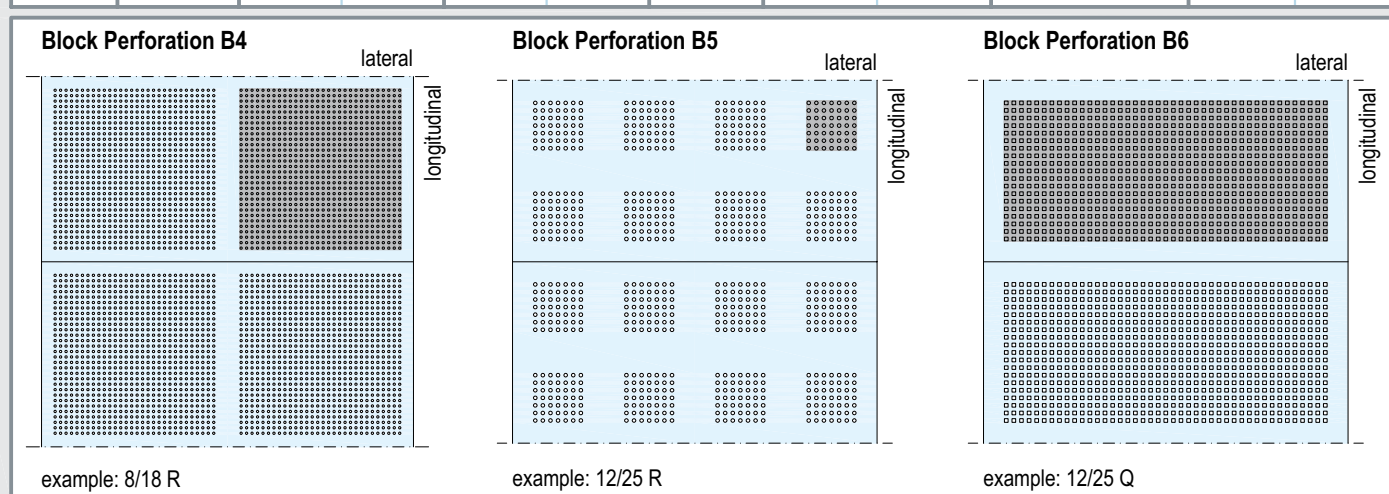
Perforation Design: Block Perforation / Types of Knauf Cleaneo Acoustic Boards



Block perforation Perimeter dimensions are optical specifications (see page 4)

scheme drawings, face side

Design	Perforation	Perforations per "block"		Perimeter non-perforated		Perforation ratio (board) %	Board dimensions (standard size)		Spacing of furring channels b mm	Edge type	
		lateral	longitudinal	lateral mm	longitud. mm		width mm	length mm		4SK	4AK
B4	8/18 R	30	30	41	41	12.1	1224	2448	312.5	●	-
	12/25 R	19	19	69	69	11.3	1200	2400	300	●	●
	12/25 Q	19	19	69	69	14.4	1200	2400	300	●	●
B5	8/18 R	13	13	41	41	9.1	1224	2448	312.5	●	-
	12/25 R	7	7	69	69	6.2	1200	2400	300	●	●
	12/25 Q	7	7	69	69	7.8	1200	2400	300	●	●
B6	8/18 R	64	30	41	41	12.9	1224	2448	312.5	●	-
	12/25 R	43	19	69	69	12.8	1200	2400	300	●	●
	12/25 Q	43	19	69	69	16.3	1200	2400	300	●	●



Edge types scheme drawings

4SK 4-side square edge

4AK 4-side tapered edge

SFK front edge, beveled

HRK long edge: half-rounded

Standard:
 Continuous perforation: 4SK
 Block slots: HRK / SFK
 Block perforation: 4SK

Board types

- Knauf Cleaneo Acoustic**
are perforated or slotted gypsum boards with air-cleaning effect due to addition of Zeolite (see also Knauf Technical Data Sheet K761)
Cleaneo Acoustic Boards 12.5 mm incl. Knauf Standard Fleece on back (black or white)
- Acoustic Plaster Base Board**
Knauf Cleaneo Acoustic Board, 12.5 mm with
 - Special plaster base paper covering on face side
 - Face side fleece (laminated waterproof)
 - Optional: PE foil lamination on back
 Standard type:
 Perforation: 12/20/66 R
 Board dimensions: 1250 x 2000 mm
 Edge: HRAK / SFK
 Application of plaster coat according to the instructions provided by the plaster manufacturer

Block Slots + Block Perforations

Boards should be of a single production line. Therefore customized boards (e.g. according to installation plan) cannot be combined with boards produced to standard specifications

Spacings of furring channels **b**

Spacings of furring channels regard only to standard board dimensions
 For customized production (e.g. according to installation plan) spacings should be adjusted to the special board dimensions (regard maximum allowable spacings)

Molded boards

Knauf Cleaneo Acoustic Boards can be bent dry in longitudinal direction
 Bending radii on request

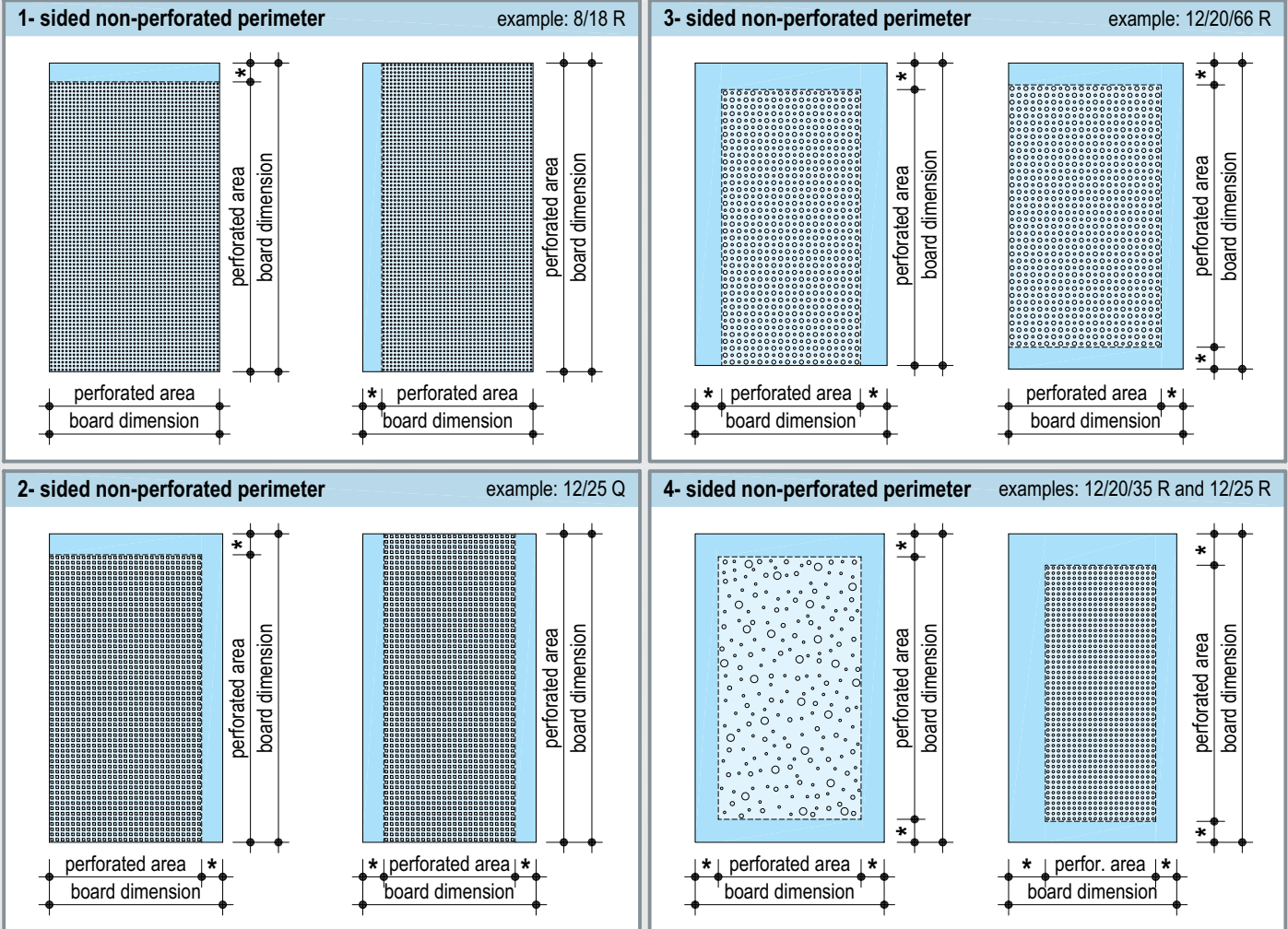
D12 Knauf Cleaneo Acoustic Ceilings

Perforation Design: Non-perforated Perimeter



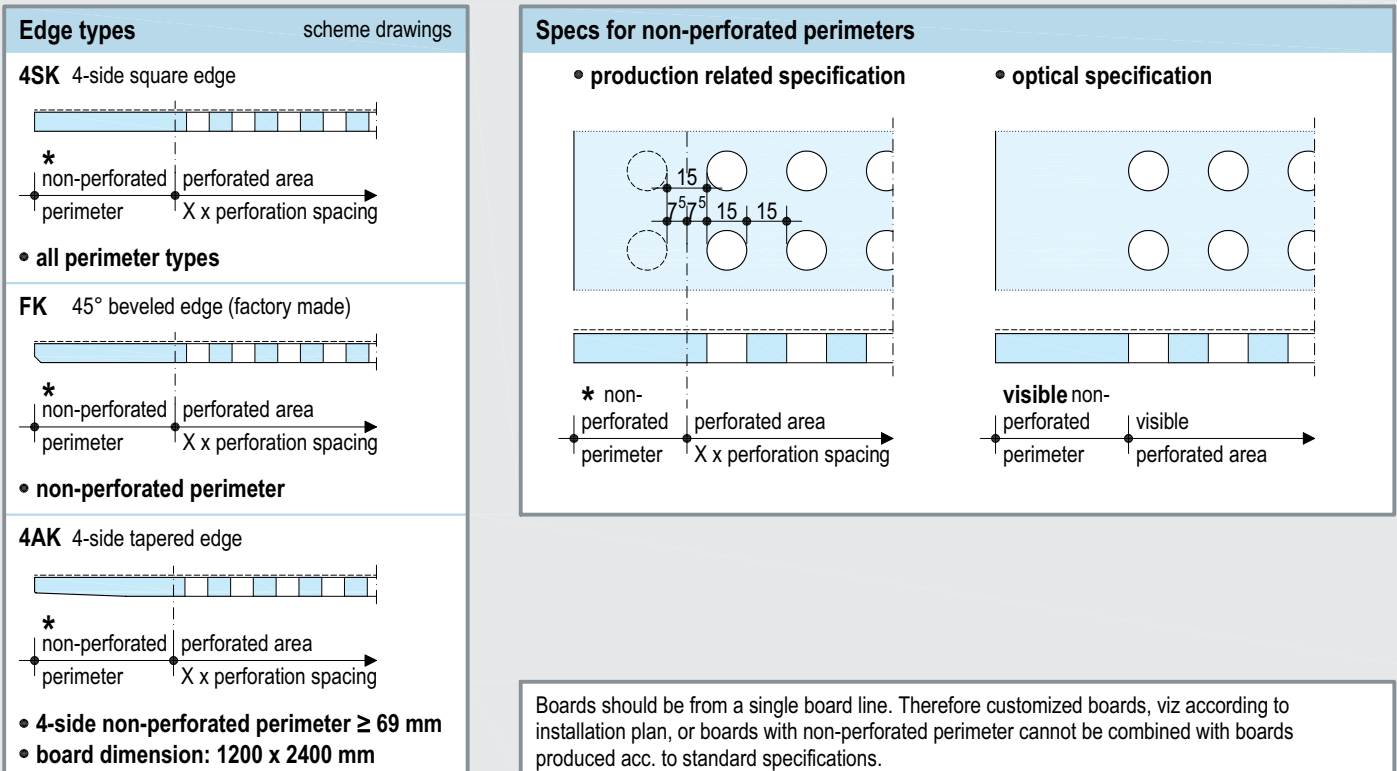
Non-perforated perimeter

scheme drawings, face side **Production related specifications**



Production related specifications

scheme drawings, example: 15/30 R



Boards should be from a single board line. Therefore customized boards, viz according to installation plan, or boards with non-perforated perimeter cannot be combined with boards produced acc. to standard specifications.

Notes

* = non-perforated perimeter, possible 1-side to 4-side
 Regard further information on pages 2 and 3

D12 Knauf Cleaneo Acoustic Ceilings

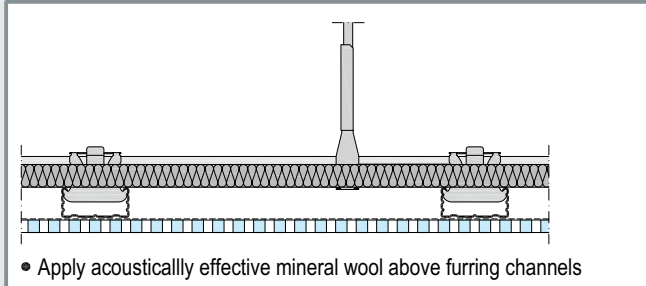
Sound Absorption, Material / Definition of Terms

Material

- **Cladding:** Knauf Cleaneo Acoustic Board, 12.5 mm thick with laminated back side fleece (Standard Fleece)
- **Insulation:**
D127: Mineral wool acc. to DIN EN 13162, 20 mm thick; length related flow resistance value according to DIN EN 29053: $r \geq 10 \text{ kPa} \cdot \text{s/m}^2$
D124: Mineral wool, see page 21

Insulation layer

scheme drawing D127



Notes

All sound absorption coefficients stated on pages 6 to 15 are only valid for boards with factory-laminated Knauf Standard Fleece and the respective plenum height;

e.g. plenum height 200 mm = measurement according to DIN EN ISO 354 type E = E-200;

Values for other plenum heights on request

Sound absorption classes

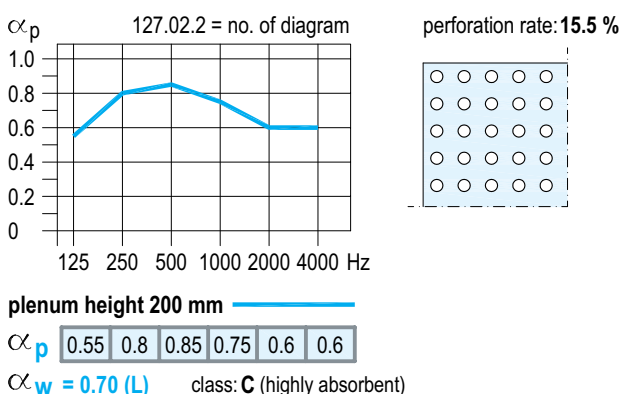
according to DIN EN ISO 11654; rated according to VDI 3755

Rated sound absorption coefficient α_w	Sound absorption class	Rating
≥ 0.9	A	most absorbent
0.8 and 0.85	B	most absorbent
0.6 to 0.75	C	highly absorbent
0.3 to 0.55	D	absorbent
0.15 to 0.25	E	low absorbent
≤ 0.1	F *)	reflecting

*) according to DIN EN ISO 11654 rated as "non-classified"

Sound absorption, example

Standard Circular 8/18 R • with Standard Fleece + mineral wool

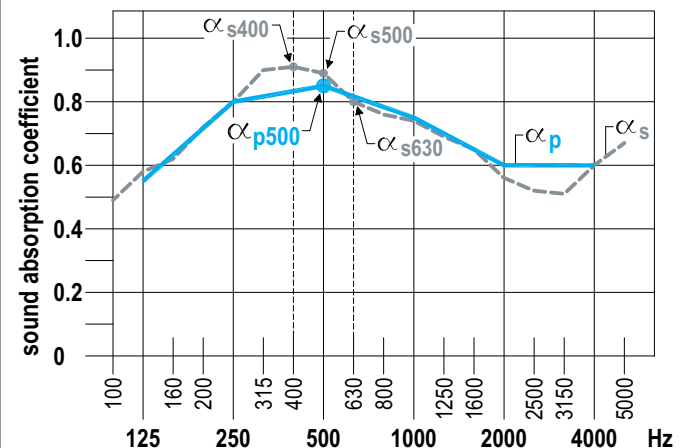


Definitions of terms regarding absorption

α_s = **Sound absorption coefficient for third octave band width**
frequency-dependent value of sound absorption coefficient measured in third octave bands, according to DIN EN ISO 354

α_p = **practical sound absorption coefficient**
from α_s on octave bands
converted according to DIN EN ISO 11654

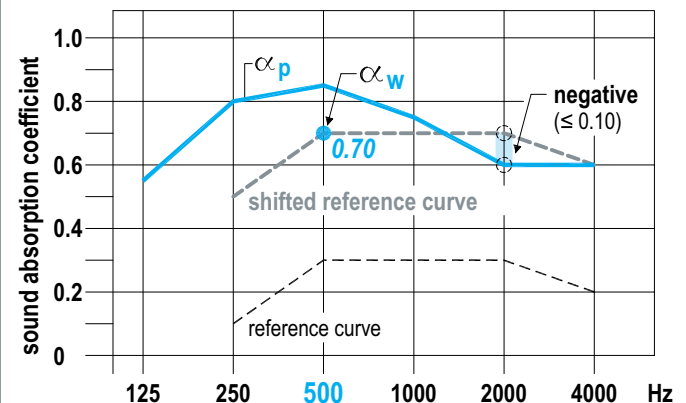
$$\text{example for 500 Hz: } \alpha_{p500} = \frac{\alpha_{s400} + \alpha_{s500} + \alpha_{s630}}{3}$$



α_w = **rated sound absorption coefficient**
according to DIN EN ISO 11654

= **frequency-dependent single number parameter of sound absorption coefficient** determined from shifted reference curve (negative deviation ≤ 0.10) and point of intersection at **500 Hz** according to DIN EN ISO 11654

example:

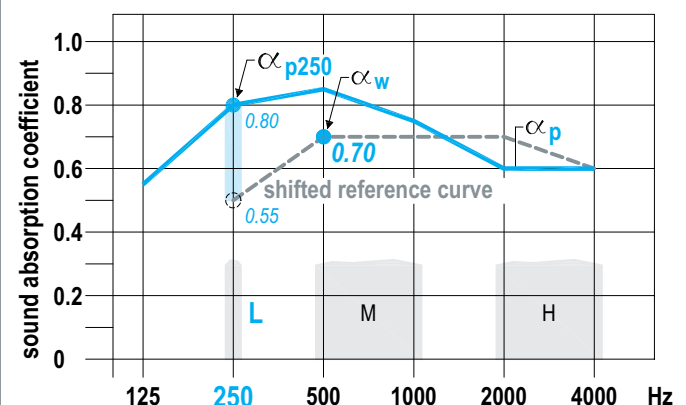


α_w with layout indicators = α_w (...)

If α_p exceeds the reference curve for a single octave frequency for ≥ 0.25 then add:

(L) at 250 Hz (M) at 500 or 1000 Hz (H) at 2000 or 4000 Hz

example (250 Hz): $0.80 - 0.55 = 0.25 (\geq 0.25) = (L) \rightarrow \alpha_w = 0.70$ (L)



D127 Knauf Cleaneo Acoustic Design Ceiling

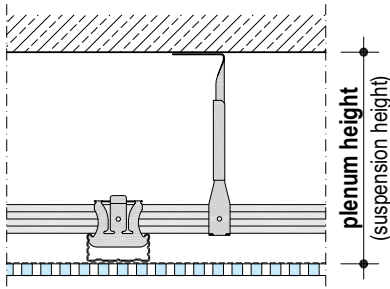
Sound Absorption, Ceiling Construction / Continuous Perforation



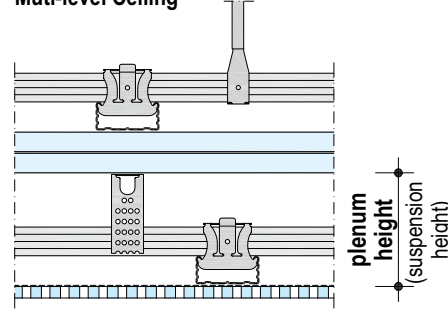
Ceiling construction for systems D127 Cleaneo Acoustic Design Ceiling / Multi-level Ceiling

scheme drawings

D127



Multi-level Ceiling



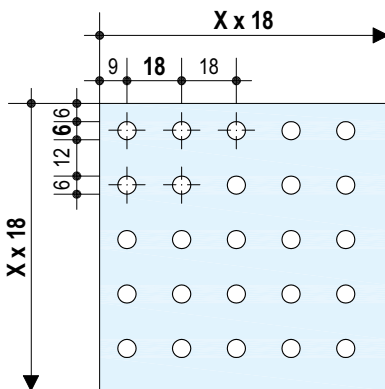
Note:

- The suspension height of the ceiling resp. plenum height (clearance) between Knauf Cleaneo Acoustic cladding and basic ceiling (D127) or between Cleaneo Acoustic cladding and gypsum board cladding of the fire protection level (Multi-level Ceiling) is a crucial parameter of acoustical efficiency.
- Increased plenum heights improve sound absorption coefficients of low frequencies. At the same time higher efficiency can be achieved in a wider frequency spectrum.

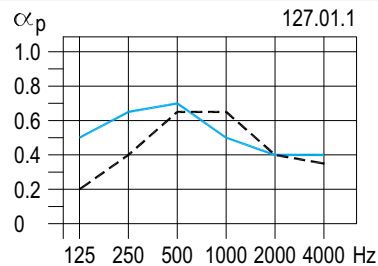
Continuous perforation

Standard Circular 6/18 R

Perforation ratio: 8.7 %



• with Standard Fleece



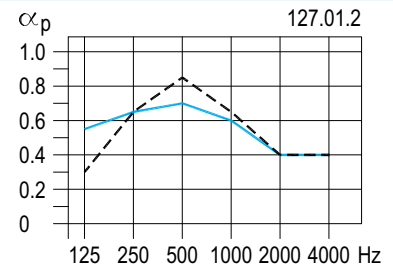
plenum height 60 mm -----

α_p 0.2 0.4 0.65 0.65 0.4 0.35
 $\alpha_w = 0.45$ class: D (absorbent)

plenum height 200 mm -----

α_p 0.5 0.65 0.7 0.5 0.4 0.4
 $\alpha_w = 0.50$ (L) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

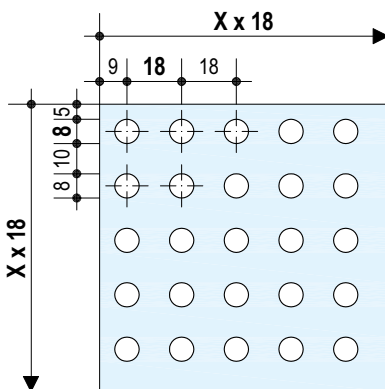
α_p 0.3 0.65 0.85 0.65 0.4 0.4
 $\alpha_w = 0.50$ (LM) class: D (absorbent)

plenum height 200 mm -----

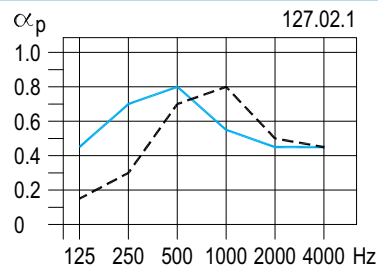
α_p 0.55 0.65 0.7 0.6 0.4 0.4
 $\alpha_w = 0.50$ (L) class: D (absorbent)

Standard Circular 8/18 R

Perforation ratio: 15.5 %



• with Standard Fleece



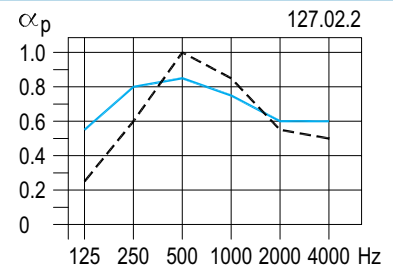
plenum height 60 mm -----

α_p 0.15 0.3 0.7 0.8 0.5 0.45
 $\alpha_w = 0.55$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.7 0.8 0.55 0.45 0.45
 $\alpha_w = 0.55$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.6 1.0 0.85 0.55 0.5
 $\alpha_w = 0.60$ (M) class: C (highly absorbent)

plenum height 200 mm -----

α_p 0.55 0.8 0.85 0.75 0.6 0.6
 $\alpha_w = 0.70$ (L) class: C (highly absorbent)

scheme drawings, face side

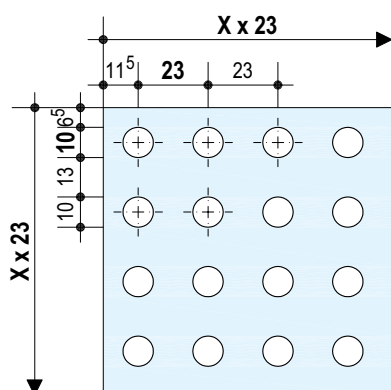
D127 Knauf Cleaneo Acoustic Design Ceiling

Sound Absorption, Continuous Perforation

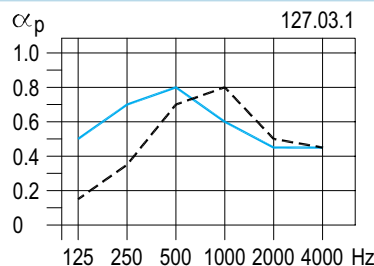


Standard Circular 10/23 R

Perforation ratio: 14.8 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.35 0.7 0.8 0.5 0.45

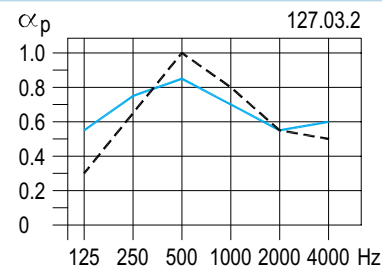
$\alpha_w = 0.55$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.5 0.7 0.8 0.6 0.45 0.45

$\alpha_w = 0.55$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.3 0.65 1 0.8 0.55 0.5

$\alpha_w = 0.60$ (LM) class: C (highly absorbent)

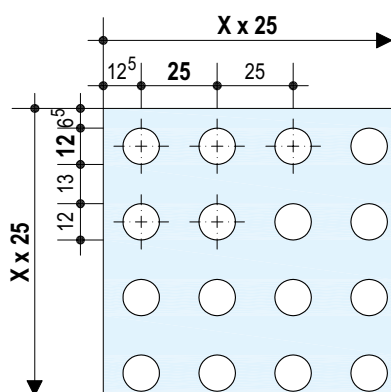
plenum height 200 mm -----

α_p 0.55 0.75 0.85 0.7 0.55 0.6

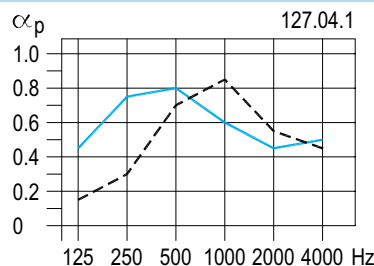
$\alpha_w = 0.65$ (L) class: C (highly absorbent)

Standard Circular 12/25 R

Perforation ratio: 18.1 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.3 0.7 0.85 0.55 0.45

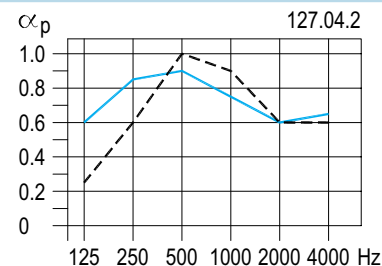
$\alpha_w = 0.55$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.75 0.8 0.6 0.45 0.5

$\alpha_w = 0.55$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.6 1 0.9 0.6 0.6

$\alpha_w = 0.70$ (M) class: C (highly absorbent)

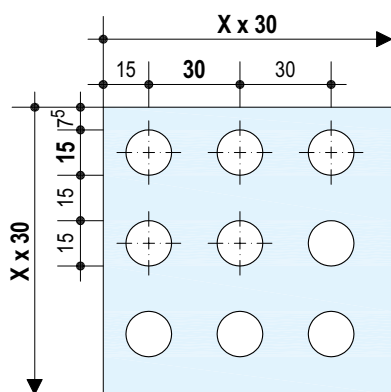
plenum height 200 mm -----

α_p 0.6 0.85 0.9 0.75 0.6 0.65

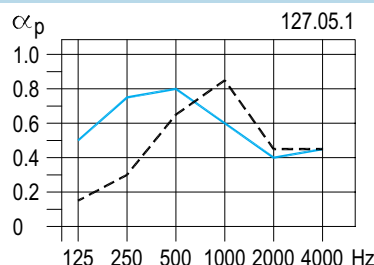
$\alpha_w = 0.70$ (L) class: C (highly absorbent)

Standard Circular 15/30 R

Perforation ratio: 19.6 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.3 0.65 0.85 0.45 0.45

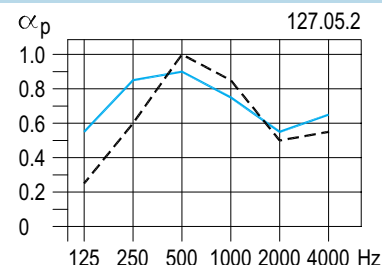
$\alpha_w = 0.50$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.5 0.75 0.8 0.6 0.4 0.45

$\alpha_w = 0.50$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.6 1 0.85 0.5 0.55

$\alpha_w = 0.60$ (M) class: C (highly absorbent)

plenum height 200 mm -----

α_p 0.55 0.85 0.9 0.75 0.55 0.65

$\alpha_w = 0.65$ (LM) class: C (highly absorbent)

scheme drawings, face side

Note

Regard comment on page 5

Proof

Knauf Sound Insulation Proof: A 001-05.05

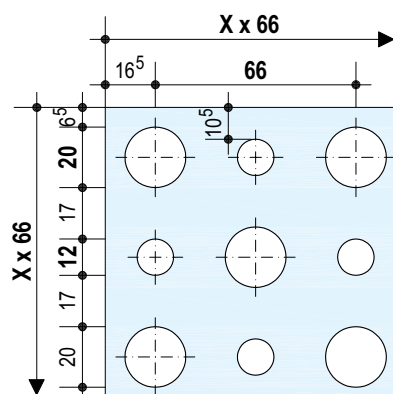
D127 Knauf Cleaneo Acoustic Design Ceiling

Sound Absorption, Continuous Perforation

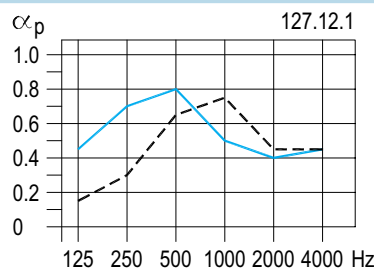


Alternating Circular 12/20/66 R

Perforation ratio: 19.6 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.3 0.65 0.75 0.45 0.45

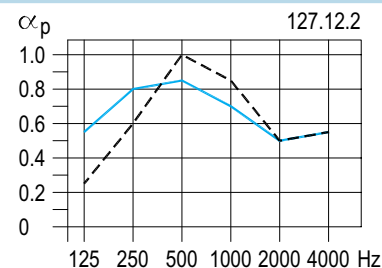
$\alpha_w = 0.50$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.7 0.8 0.5 0.4 0.45

$\alpha_w = 0.50$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.6 1 0.85 0.5 0.55

$\alpha_w = 0.60$ (M) class: C (highly absorbent)

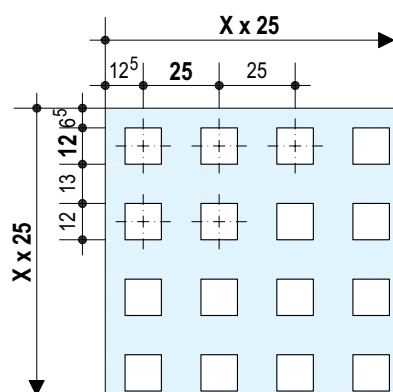
plenum height 200 mm -----

α_p 0.55 0.8 0.85 0.7 0.5 0.55

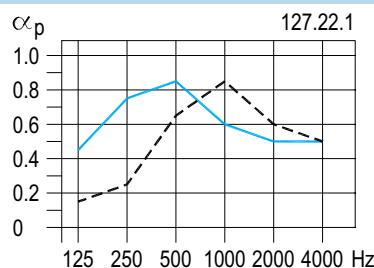
$\alpha_w = 0.60$ (LM) class: C (highly absorbent)

Standard Square 12/25 Q

Perforation ratio: 23.0 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.25 0.65 0.85 0.6 0.5

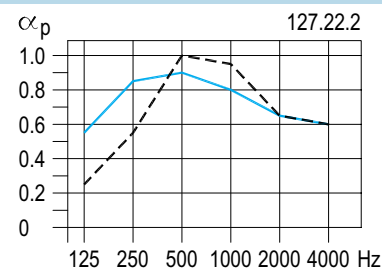
$\alpha_w = 0.55$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.75 0.85 0.6 0.5 0.5

$\alpha_w = 0.60$ (LM) class: C (highly absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.55 1 0.95 0.65 0.6

$\alpha_w = 0.70$ (M) class: C (highly absorbent)

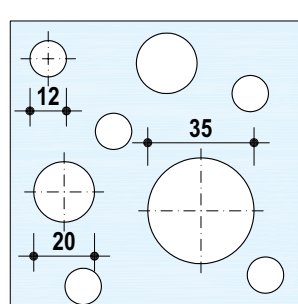
plenum height 200 mm -----

α_p 0.55 0.85 0.9 0.8 0.65 0.6

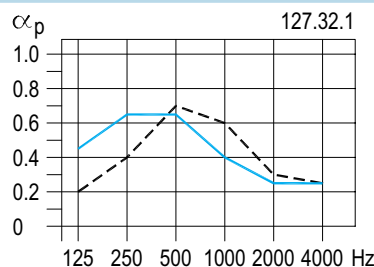
$\alpha_w = 0.70$ (L) class: C (highly absorbent)

Random PLUS 12/20/35 R

Perforation ratio: 9.8 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.2 0.4 0.7 0.6 0.3 0.25

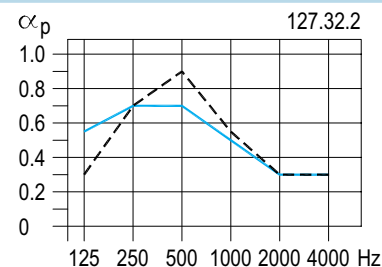
$\alpha_w = 0.35$ (LM) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.65 0.65 0.4 0.25 0.25

$\alpha_w = 0.35$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.3 0.7 0.9 0.55 0.3 0.3

$\alpha_w = 0.40$ (LM) class: D (absorbent)

plenum height 200 mm -----

α_p 0.55 0.7 0.7 0.5 0.3 0.3

$\alpha_w = 0.40$ (LM) class: D (absorbent)

scheme drawings, face side

Note

Regard comment on page 5

Proofs

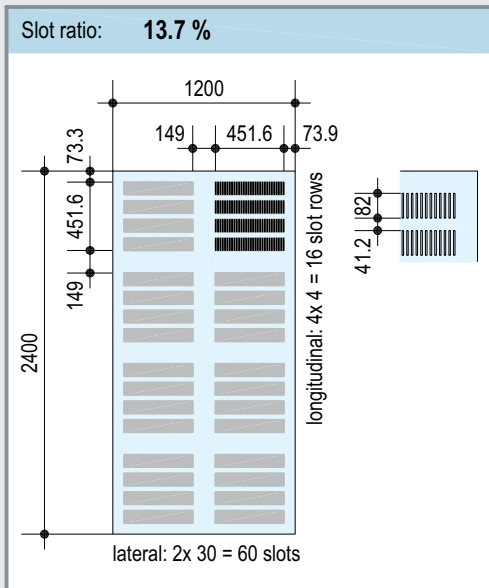
Knauf Sound Insulation Proofs: A 002-05.05; A 003-05.05; A 004-05.05

D127 Knauf Cleaneo Acoustic Design Ceiling

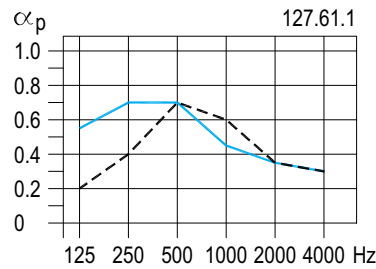
Sound Absorption, Block Slots "slotline"



Design B4 - "slotline"



• with Standard Fleece



plenum height 60 mm -----

α_p 0.2 0.4 0.7 0.6 0.35 0.3

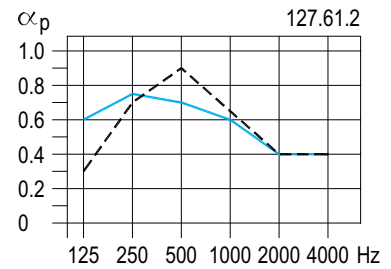
$\alpha_w = 0.40$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.55 0.7 0.7 0.45 0.35 0.3

$\alpha_w = 0.40$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.3 0.7 0.9 0.65 0.4 0.4

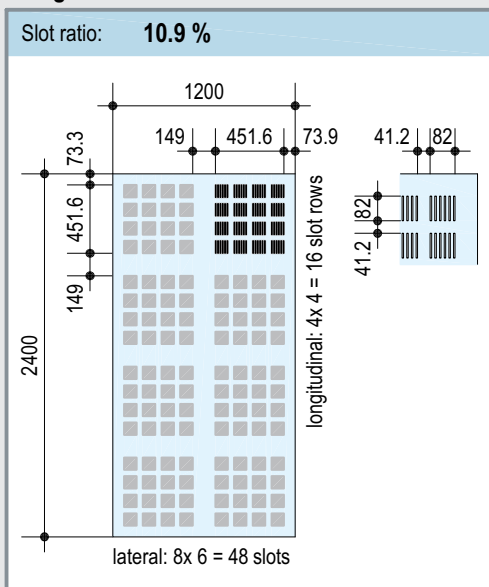
$\alpha_w = 0.50$ (LM) class: D (absorbent)

plenum height 200 mm -----

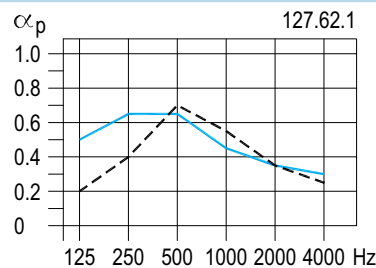
α_p 0.6 0.75 0.7 0.6 0.4 0.4

$\alpha_w = 0.50$ (L) class: D (absorbent)

Design B5 - "slotline"



• with Standard Fleece



plenum height 60 mm -----

α_p 0.2 0.4 0.7 0.55 0.35 0.25

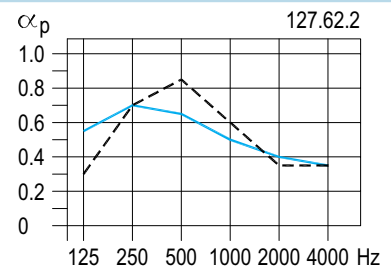
$\alpha_w = 0.40$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.5 0.65 0.65 0.45 0.35 0.3

$\alpha_w = 0.40$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.3 0.7 0.85 0.6 0.35 0.35

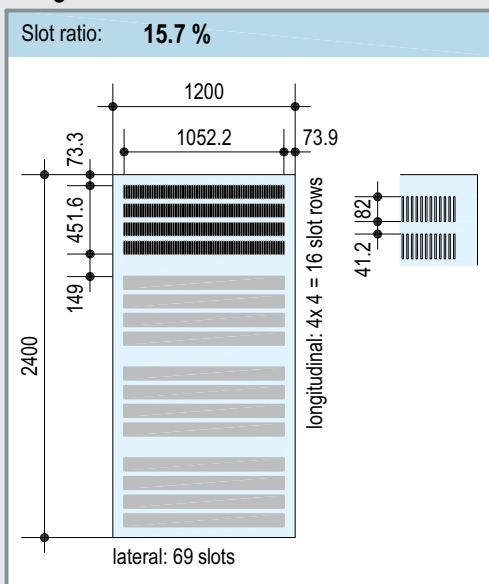
$\alpha_w = 0.45$ (LM) class: D (absorbent)

plenum height 200 mm -----

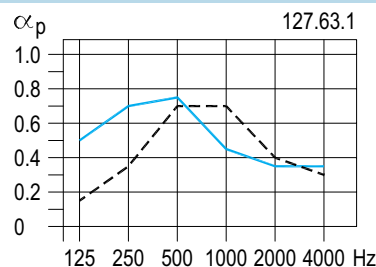
α_p 0.55 0.7 0.65 0.5 0.4 0.35

$\alpha_w = 0.45$ (L) class: D (absorbent)

Design B6 - "slotline"



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.35 0.7 0.7 0.4 0.3

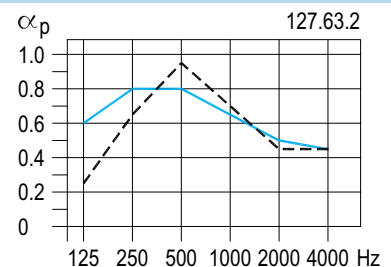
$\alpha_w = 0.45$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.5 0.7 0.75 0.45 0.35 0.35

$\alpha_w = 0.45$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.65 0.95 0.7 0.45 0.45

$\alpha_w = 0.55$ (LM) class: D (absorbent)

plenum height 200 mm -----

α_p 0.6 0.8 0.8 0.65 0.5 0.45

$\alpha_w = 0.55$ (LM) class: D (absorbent)

scheme drawings, dimensions are optical specifications, see page 4

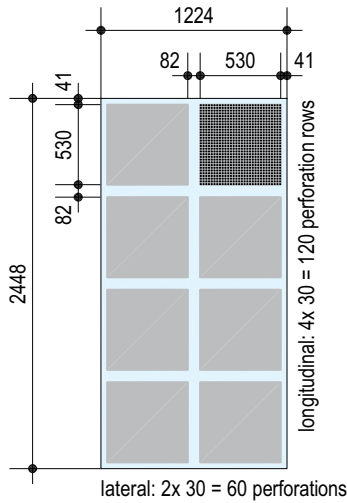
D127 Knauf Cleaneo Acoustic Design Ceiling

Sound Absorption, Block Perforation 8/18 R

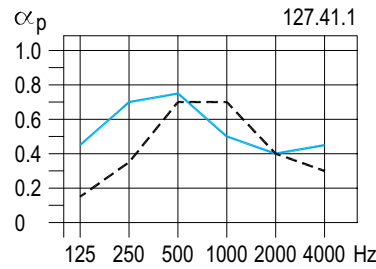


Design B4 - 8/18 R

Perforation ratio: 12.1 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.35 0.7 0.7 0.4 0.3

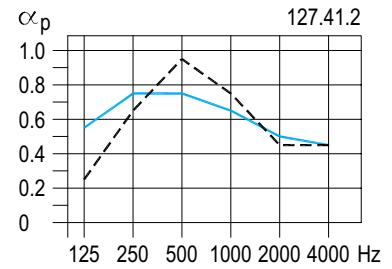
$\alpha_w = 0.45$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.7 0.75 0.5 0.4 0.45

$\alpha_w = 0.50$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.65 0.95 0.75 0.45 0.45

$\alpha_w = 0.55$ (LM) class: D (absorbent)

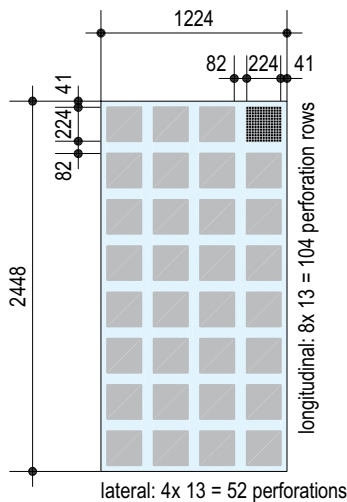
plenum height 200 mm -----

α_p 0.55 0.75 0.75 0.65 0.5 0.45

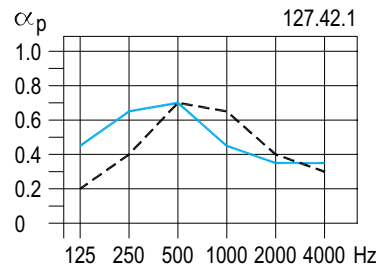
$\alpha_w = 0.55$ (L) class: D (absorbent)

Design B5 - 8/18 R

Perforation ratio: 9.1 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.2 0.4 0.7 0.65 0.4 0.3

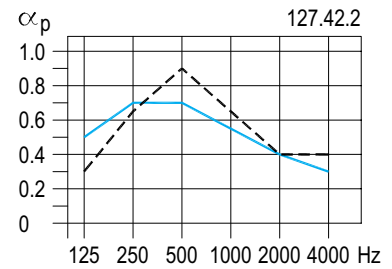
$\alpha_w = 0.45$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.65 0.7 0.45 0.35 0.35

$\alpha_w = 0.45$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.3 0.65 0.9 0.65 0.4 0.4

$\alpha_w = 0.50$ (LM) class: D (absorbent)

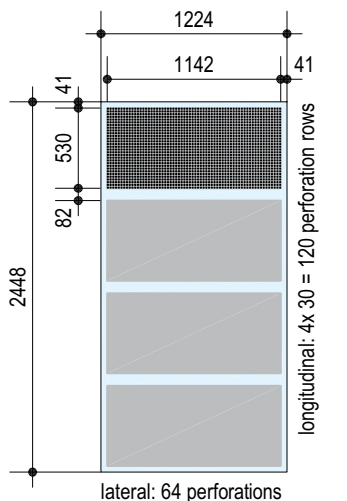
plenum height 200 mm -----

α_p 0.5 0.7 0.7 0.55 0.4 0.3

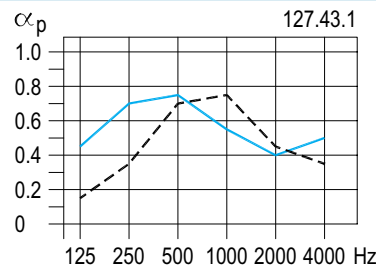
$\alpha_w = 0.45$ (LM) class: D (absorbent)

Design B6 - 8/18 R

Perforation ratio: 12.9 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.35 0.7 0.75 0.45 0.35

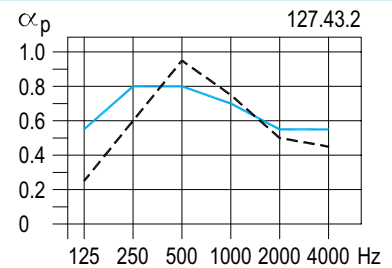
$\alpha_w = 0.50$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.7 0.75 0.55 0.4 0.5

$\alpha_w = 0.50$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.6 0.95 0.75 0.5 0.45

$\alpha_w = 0.55$ (LM) class: D (absorbent)

plenum height 200 mm -----

α_p 0.55 0.8 0.8 0.7 0.55 0.55

$\alpha_w = 0.65$ (L) class: C (highly absorbent)

scheme drawings, dimensions are optical specifications, see page 4

Note

Regard comment on page 5

Proof

Knauf Sound Insulation Proof: A 006-05.05

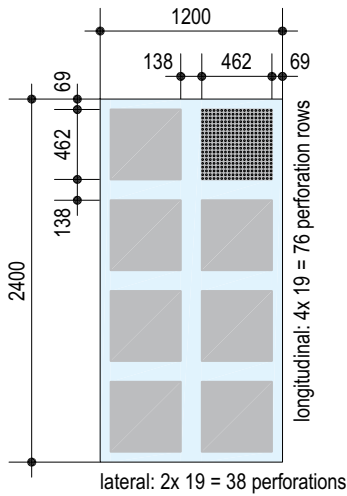
D127 Knauf Cleaneo Acoustic Design Ceiling

Sound Absorption, Block Perforation 12/25 R

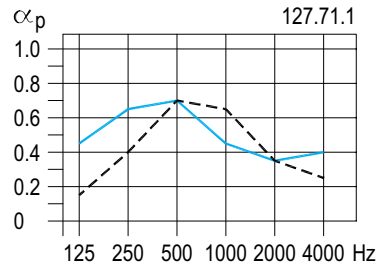


Design B4 - 12/25 R

Perforation ratio: 11.3 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.4 0.7 0.65 0.35 0.25

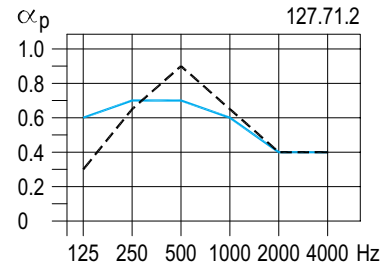
$\alpha_w = 0.40$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.65 0.7 0.45 0.35 0.4

$\alpha_w = 0.45$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.3 0.65 0.9 0.65 0.4 0.4

$\alpha_w = 0.50$ (LM) class: D (absorbent)

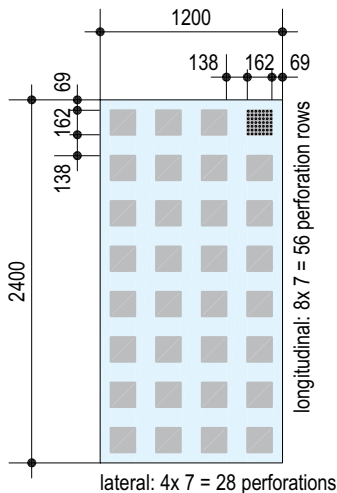
plenum height 200 mm -----

α_p 0.6 0.7 0.7 0.6 0.4 0.4

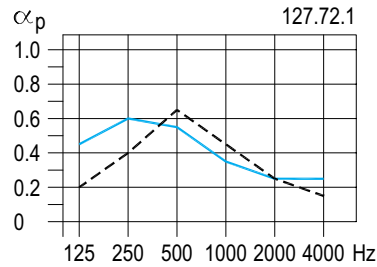
$\alpha_w = 0.50$ (L) class: D (absorbent)

Design B5 - 12/25 R

Perforation ratio: 6.2 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.2 0.4 0.65 0.45 0.25 0.15

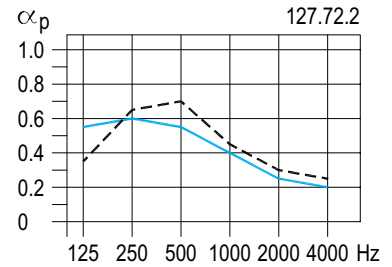
$\alpha_w = 0.30$ (LM) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.6 0.55 0.35 0.25 0.25

$\alpha_w = 0.35$ (L) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.35 0.65 0.7 0.45 0.3 0.25

$\alpha_w = 0.35$ (LM) class: D (absorbent)

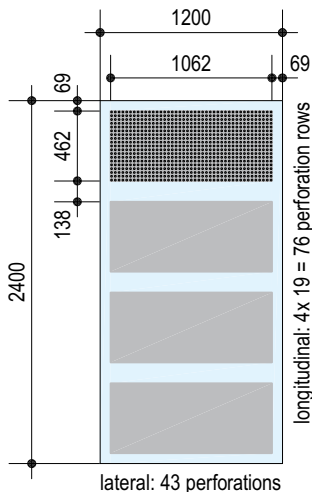
plenum height 200 mm -----

α_p 0.55 0.6 0.55 0.4 0.25 0.2

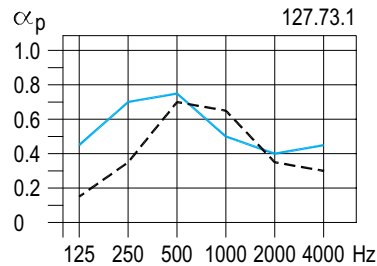
$\alpha_w = 0.30$ (LM) class: D (absorbent)

Design B6 - 12/25 R

Perforation ratio: 12.8 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.35 0.7 0.65 0.35 0.3

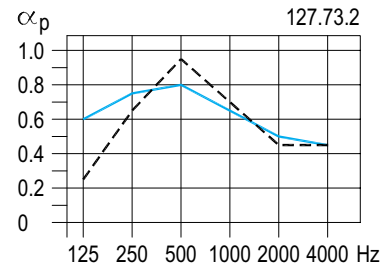
$\alpha_w = 0.40$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.7 0.75 0.5 0.4 0.45

$\alpha_w = 0.50$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.65 0.95 0.7 0.45 0.45

$\alpha_w = 0.55$ (LM) class: D (absorbent)

plenum height 200 mm -----

α_p 0.6 0.75 0.8 0.65 0.5 0.45

$\alpha_w = 0.55$ (LM) class: D (absorbent)

scheme drawings, dimensions are optical specifications, see page 4

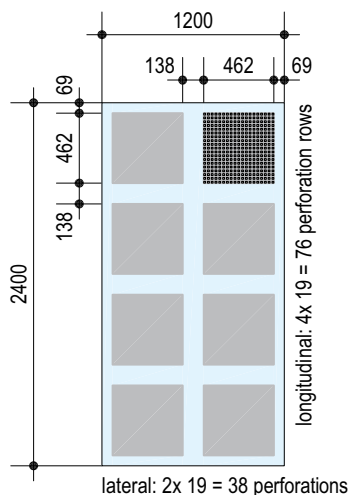
D127 Knauf Cleaneo Acoustic Design Ceiling

Sound Absorption, Block Perforation 12/25 Q

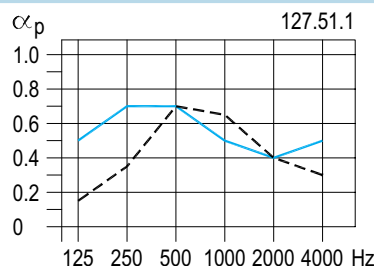


Design B4 - 12/25 Q

Perforation ratio: 14.4 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.35 0.7 0.65 0.4 0.3

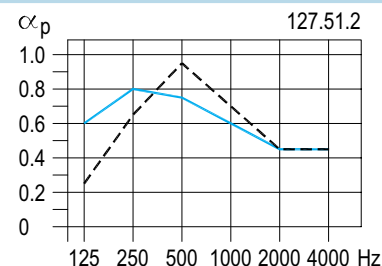
$\alpha_w = 0.45$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.5 0.7 0.7 0.5 0.4 0.5

$\alpha_w = 0.50$ (L) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.65 0.95 0.7 0.45 0.45

$\alpha_w = 0.55$ (LM) class: D (absorbent)

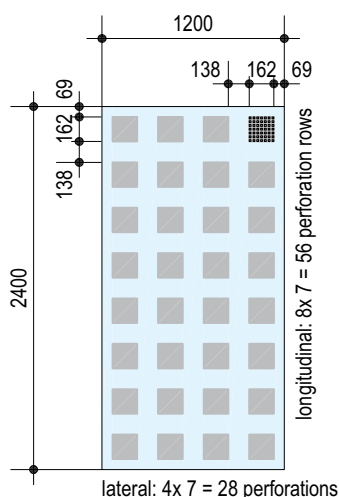
plenum height 200 mm -----

α_p 0.6 0.8 0.75 0.6 0.45 0.45

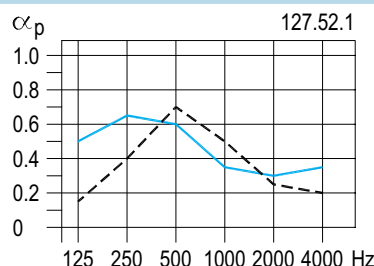
$\alpha_w = 0.55$ (L) class: D (absorbent)

Design B5 - 12/25 Q

Perforation ratio: 7.8 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.15 0.4 0.7 0.5 0.25 0.2

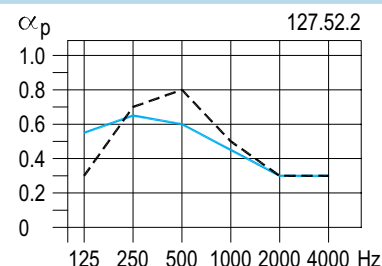
$\alpha_w = 0.30$ (LM) class: D (absorbent)

plenum height 200 mm -----

α_p 0.5 0.65 0.6 0.35 0.3 0.35

$\alpha_w = 0.35$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.3 0.7 0.8 0.5 0.3 0.3

$\alpha_w = 0.40$ (LM) class: D (absorbent)

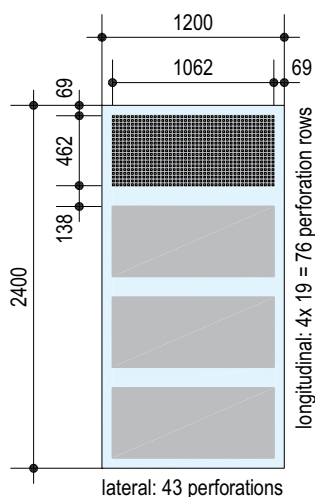
plenum height 200 mm -----

α_p 0.55 0.65 0.6 0.45 0.3 0.3

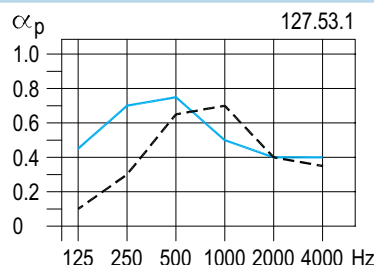
$\alpha_w = 0.40$ (L) class: D (absorbent)

Design B6 - 12/25 Q

Perforation ratio: 16.3 %



• with Standard Fleece



plenum height 60 mm -----

α_p 0.1 0.3 0.65 0.7 0.4 0.35

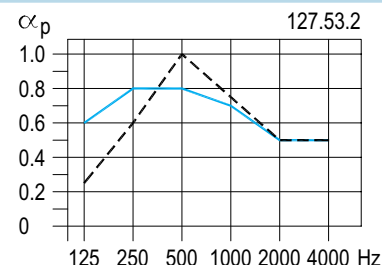
$\alpha_w = 0.45$ (M) class: D (absorbent)

plenum height 200 mm -----

α_p 0.45 0.7 0.75 0.5 0.4 0.4

$\alpha_w = 0.50$ (LM) class: D (absorbent)

• with Standard Fleece + mineral wool



plenum height 60 mm -----

α_p 0.25 0.6 1 0.75 0.5 0.5

$\alpha_w = 0.60$ (M) class: C (highly absorbent)

plenum height 200 mm -----

α_p 0.6 0.8 0.8 0.7 0.5 0.5

$\alpha_w = 0.60$ (L) class: C (highly absorbent)

scheme drawings, dimensions are optical specifications, see page 4

Note

Regard comment on page 5

Proof

Knauf Sound Insulation Proof: A 007-05.05

D124 Knauf Cleaneo Acoustic Ceilings

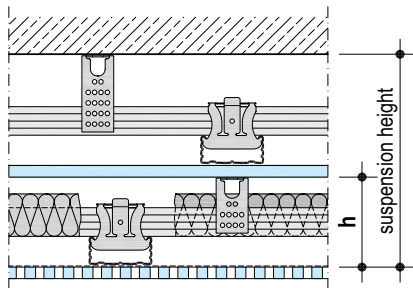
Sound Absorption, Ceiling Construction / Continuous Perforation



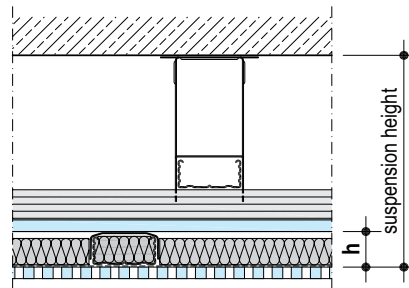
Ceiling construction for systems D124 Cleaneo Acoustic Fire Protection Ceiling

scheme drawings

D124
2nd grid level with Universal Bracket



D124
2nd grid level with Direct Bracket



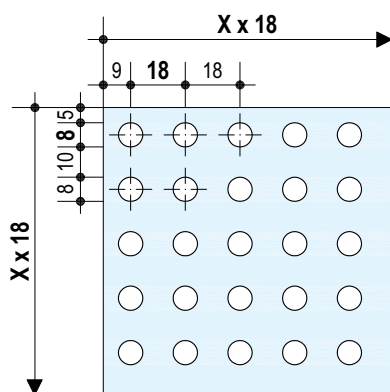
Note:

- The main parameter for the acoustical efficiency of the system is the clearance (h) between Cleaneo Acoustic Board and the non-perforated gypsum board.
- The suspension height of the system (space between Cleaneo Acoustic Board and basic ceiling) is of low influence for the acoustical efficiency. Therefore, different suspension heights can be used for the specified parameters.

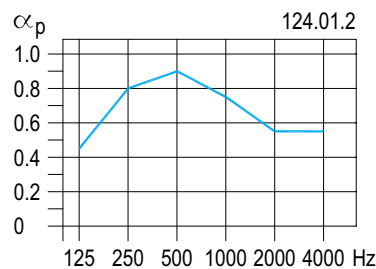
Continuous perforations

Standard Circular 8/18 R

Perforation ratio: **15.5 %**



• D124 with Universal Bracket with Standard Fleece + mineral wool



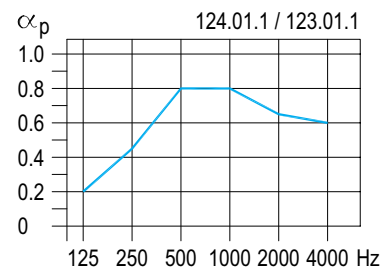
suspension height 200 mm

(h = 100 mm)

α_p 0.45 0.8 0.9 0.75 0.55 0.55

$\alpha_w = 0.65$ (LM) class: C (highly absorbent)

• D124 with Direct Bracket with Standard Fleece + mineral wool



suspension height 200 mm

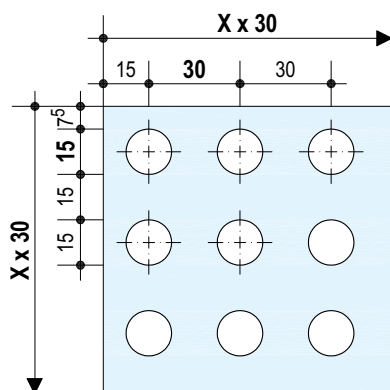
(h = approx. 28 mm)

α_p 0.2 0.45 0.8 0.8 0.65 0.6

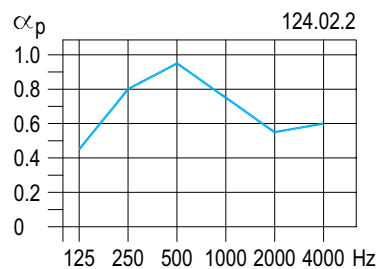
$\alpha_w = 0.70$ class: C (highly absorbent)

Standard Circular 15/30 R

Perforation ratio: **19.6 %**



• D124 with Universal Bracket with Standard Fleece + mineral wool



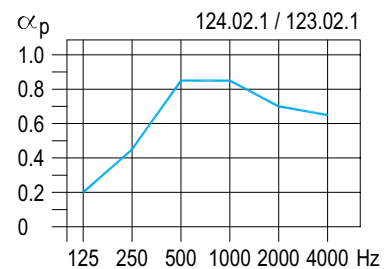
suspension height 200 mm

(h = 100 mm)

α_p 0.45 0.8 0.95 0.75 0.55 0.6

$\alpha_w = 0.65$ (LM) class: C (highly absorbent)

• D124 with Direct Bracket with Standard Fleece + mineral wool



suspension height 200 mm

(h = approx. 28 mm)

α_p 0.2 0.45 0.85 0.85 0.7 0.65

$\alpha_w = 0.70$ class: C (highly absorbent)

scheme drawings, face side

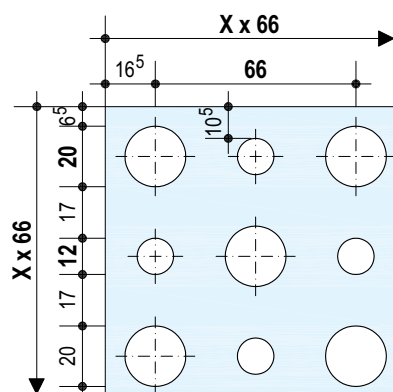
D124 / Knauf Cleaneo Acoustic Ceilings

Sound Absorption, Continuous Perforation

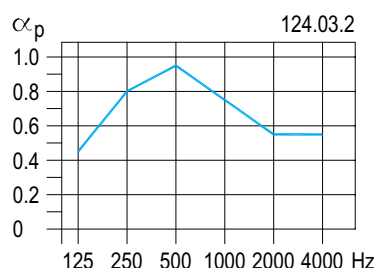


Alternating Circular 12/20/66 R

Perforation ratio: 19.6 %

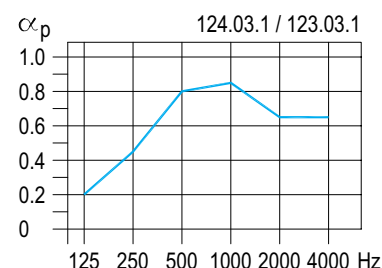


• D124 with Universal Bracket
with Standard Fleece + mineral wool



suspension height 200 mm
(h = 100 mm)
 α_p 0.45 0.8 0.95 0.75 0.55 0.55
 $\alpha_w = 0.65$ (LM) class: C (highly absorbent)

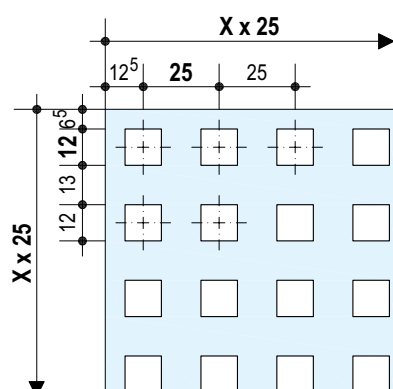
• D124 with Direct Bracket
with Standard Fleece + mineral wool



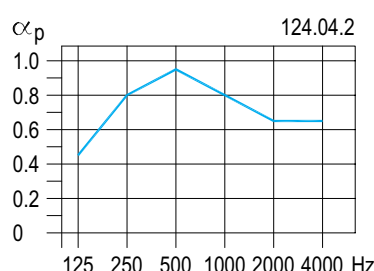
suspension height 200 mm
(h = approx. 28 mm)
 α_p 0.2 0.45 0.8 0.85 0.65 0.65
 $\alpha_w = 0.70$ class: C (highly absorbent)

Standard Square 12/25 Q

Perforation ratio: 23.0 %

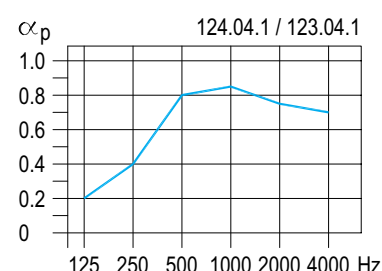


• D124 with Universal Bracket
with Standard Fleece + mineral wool



suspension height 200 mm
(h = 100 mm)
 α_p 0.45 0.8 0.95 0.8 0.65 0.65
 $\alpha_w = 0.75$ (L) class: C (highly absorbent)

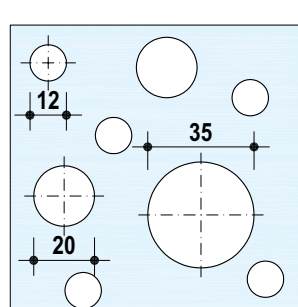
• D124 with Direct Bracket
with Standard Fleece + mineral wool



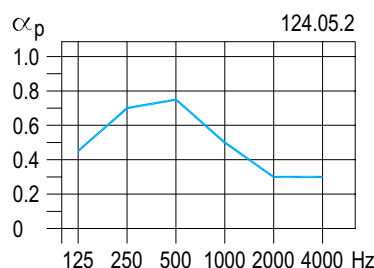
suspension height 200 mm
(h = approx. 28 mm)
 α_p 0.2 0.4 0.8 0.85 0.75 0.7
 $\alpha_w = 0.70$ class: C (highly absorbent)

Random PLUS 12/20/35 R

Perforation ratio: 9.8 %

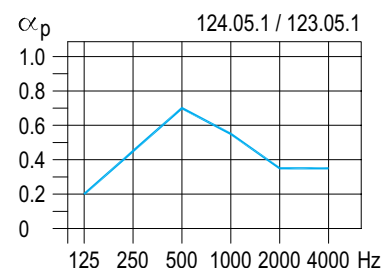


• D124 with Universal Bracket
with Standard Fleece + mineral wool



suspension height 200 mm
(h = 100 mm)
 α_p 0.45 0.7 0.75 0.5 0.3 0.3
 $\alpha_w = 0.40$ (LM) class: D (absorbent)

• D124 with Direct Bracket
with Standard Fleece + mineral wool



suspension height 200 mm
(h = approx. 28 mm)
 α_p 0.2 0.45 0.7 0.55 0.35 0.35
 $\alpha_w = 0.45$ (M) class: D (absorbent)

scheme drawings face side

Note

Regard comment on page 5

Proof

Knauf Sound Insulation Proof: A 008-07.05

D12 Knauf Cleaneo Acoustic Ceilings

Building Physical and Technical Properties

Knauf System

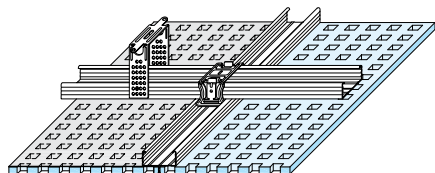
Acoustic

Fire
protection

Properties / Function

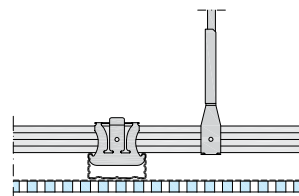
scheme drawings

D127 Knauf Cleaneo Acoustic Design Ceiling



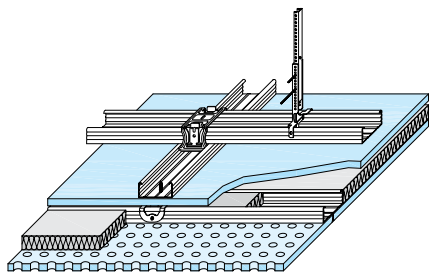
sound absorption
(see pages 5 to 13)

.



Acoustic

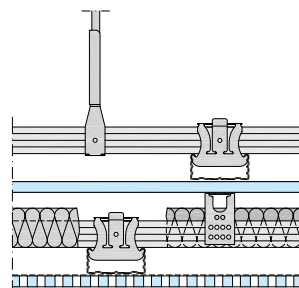
D124 Knauf Cleaneo Acoustic Fire Protection Ceiling



- 2nd grid level fastened with Direct Bracket

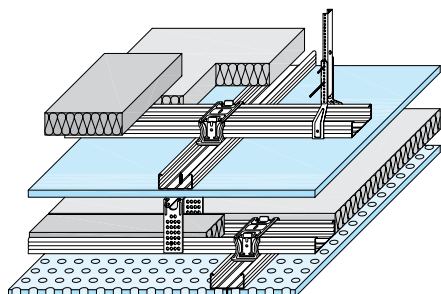
sound absorption
(see pages 5, 14+15)

F30 • solely from below
(mineral wool see page 21)



- 2nd grid level fastened with Universal Bracket

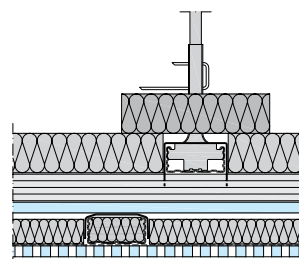
Fire protection
+
Acoustic



- 2nd grid level fastened with Universal Bracket

sound absorption
(see pages 5, 14+15)

F30 • solely fr. below + fr. above
(mineral wool see page 21)



- 2nd grid level fastened with Direct Bracket

Fire protection
+
Acoustic

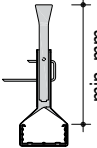
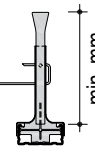
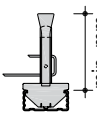
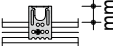
D12 Knauf Cleaneo Acoustic Ceilings

Height of Construction / Load Bearing Capacity Classes according to DIN 18168-2 / Channel Connections



Height of construction

height of construction = total of suspension height, height of grid and cladding thickness

System	Suspension					Substructure		Knauf Boards
					D124 / Multi-level Ceiling 			
	Nonius Stirrup	Nonius Hanger Bottom	Combo Hanger	Universal Bracket	Direct Bracket	CD Channel wxh	total height mm	thick- board type- ness mm
D127	130	130	130	up to 180	-	60x27+ 60x27	54	12.5 Knauf Cleaneo Acoustic Board
D124	1st grid level							
	130	130	130	up to 180	-	60x27+ 60x27	54	12.5 Knauf Fire-Resistant Board GKF
	+ 2nd grid level							+
	-	-	-	-	1	60x27	27	
	-	-	-	up to 180	-	60x27+ 60x27	54	12.5 Knauf Cleaneo Acoustic Board
Multi-level Ceiling system: height of construction depends on ceiling type								
Calculation example: D127 with Nonius Bottom (130 mm), furring and carrying channel (54 mm) and cladding (12.5 mm) = 196.5 mm approx. 197 mm required height of construction for Cleaneo Acoustic Design Ceiling								

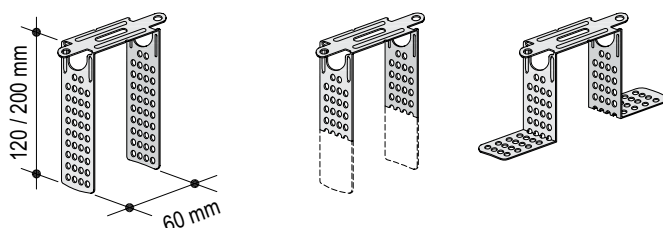
0.40 kN (40 kg) load bearing capacity class

Universal Bracket

for CD 60x27

Universal Bracket

- D127 / D124 / D123



Cut or bend Universal Bracket according to required installation height

Nonius Hanger Bottom, Nonius Stirrup, Combo Hanger

for CD 60x27

Nonius Hanger Bottom

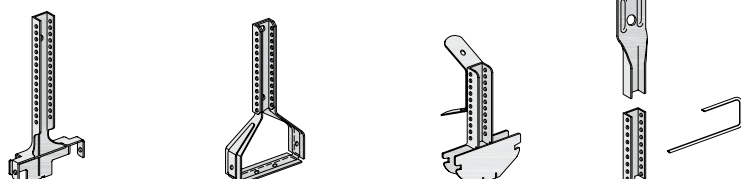
- D127 / D124

Nonius Stirrup

- D127 / D124

Combo Hanger

- D127 / D124

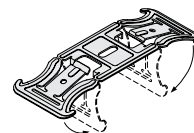


suspended with
Nonius Hanger Top
and
Nonius Pin
(secure against slide-outs)

For attachment of suspenders to basic ceiling see TDS D11 Knauf Board Ceilings

Channel connections furring ch. + carrying ch.

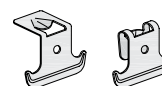
Intersection Connector for CD 60x27



bend to 90°
before installation

alternative:

2x Clip for CD 60x27



bend during
installation

Additional measures

Nonius Hanger Bottom

screw tabs with CD 60x27
(Metal Screws LN 3.5x9 mm) for:

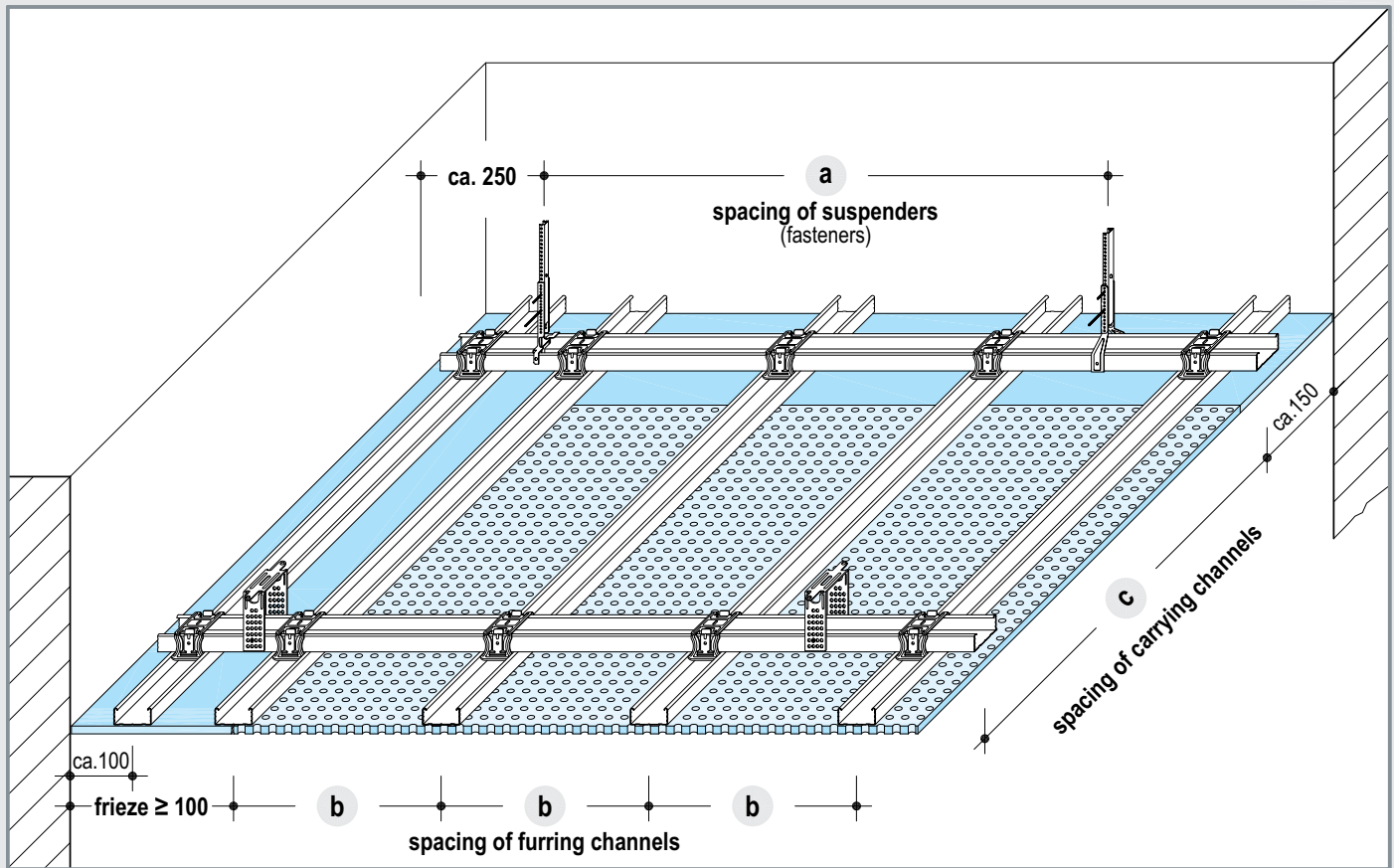
- fire protection from below and from above (plenum) and / or
- total weight of ceiling incl. loads $\geq 0.40 \text{ kN/m}^2$

D127 Knauf Cleaneo Acoustic Design Ceiling

Spacings of Substructure / Details



Metal grid



Maximum grid spacings

all dimensions in mm

Spacings of carrying channels c	Spacings of suspenders a load class kN/m ²		Spacing of furring channels b
	≤ 0.15	≤ 0.30	
500	1200	950	max. 333.5
600	1150	900	
700	1100	850	
800	1050	800	
900	1000	800	
1000	950	750	
1100	900	750	
1200	900	650	
1300	850	-	
1400	850	-	
1500	850	-	

Spacing of furring channels depending on perforation (see pages 2+3)

Note

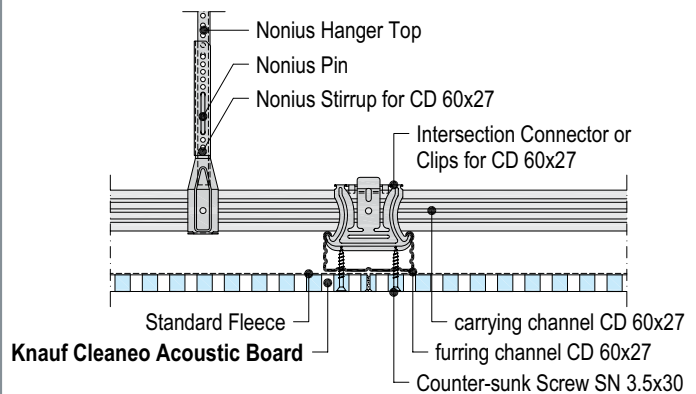
weight of boards + grid + mineral wool 20 mm
< 15 kg/m² (0.15 kN/m²)

The total weight of the ceiling is increased by additionally built-in layers that can cause a classification into load class up to 0.30 kN/m²

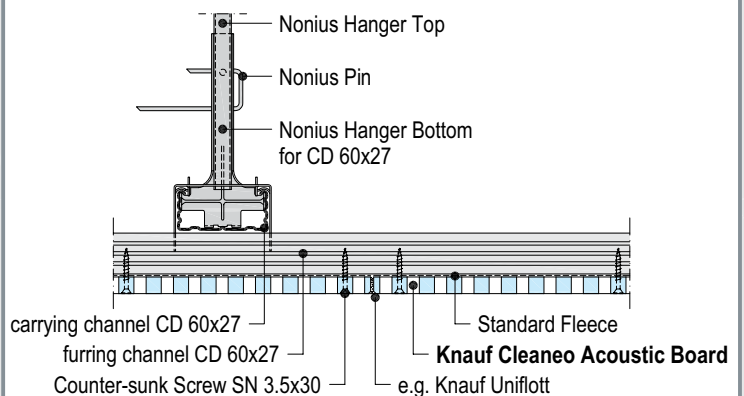
(see Technical Data Sheet D11 Knauf Board Ceilings chapter "Dimensioning of Substructure")

Details scale 1:5

D127-C1 Front edge joint e.g. continuous perforation



D127-B2 Long edge joint e.g. continuous perforation

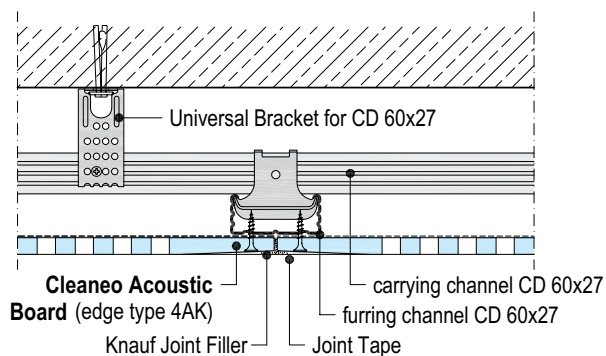


D127 Knauf Cleaneo Acoustic Design Ceiling

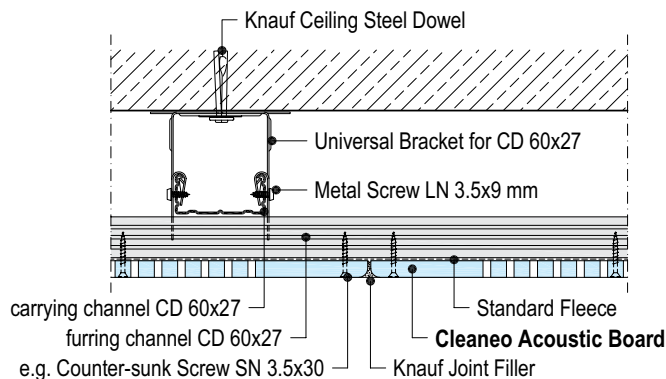
Details

Details scale 1:5

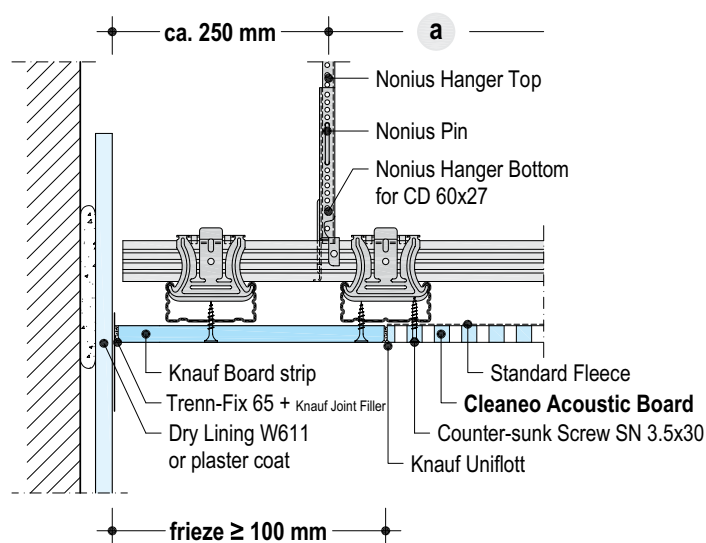
D127-C2 Front edge joint e.g. Block Perforation



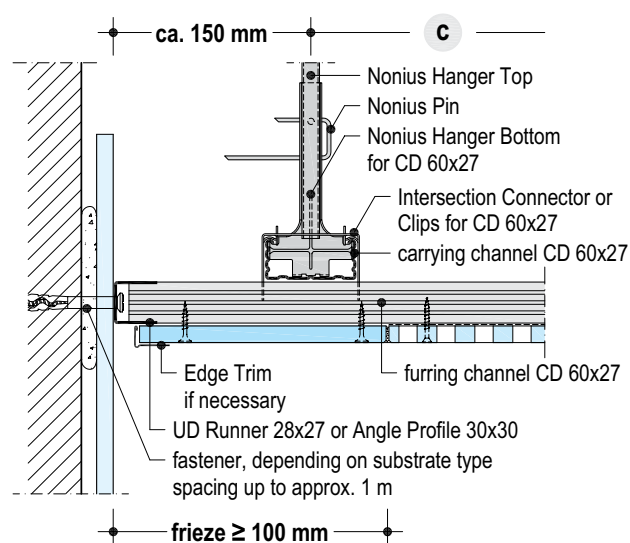
D127-B1 Long edge joint e.g. Block Slots "slotline"



D127-D3 Connection to wall



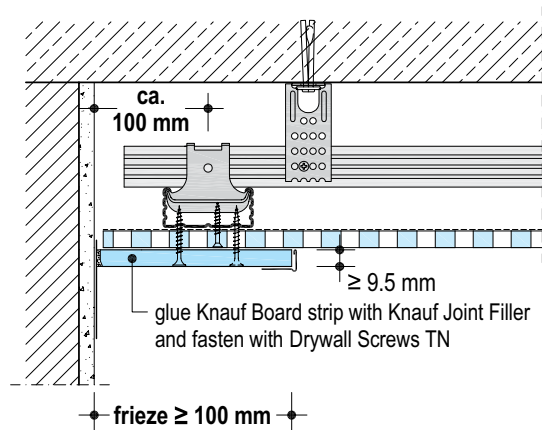
D127-A1 Connection to wall with exposed joint



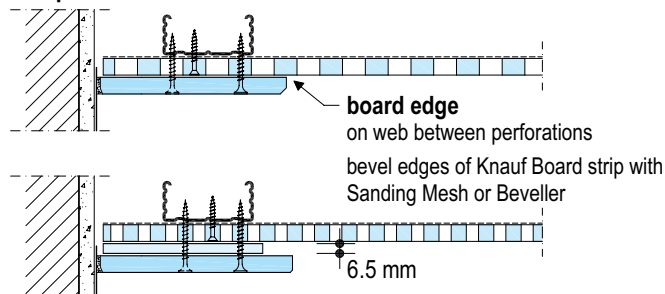
D127 Knauf Cleaneo Acoustic Design Ceiling

Details

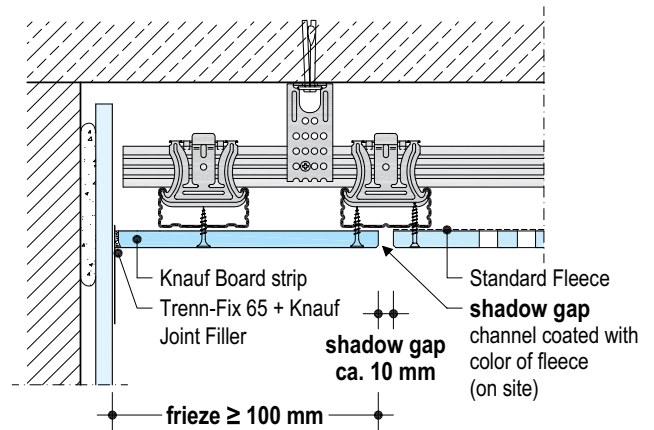
D127-D1 Crown frieze



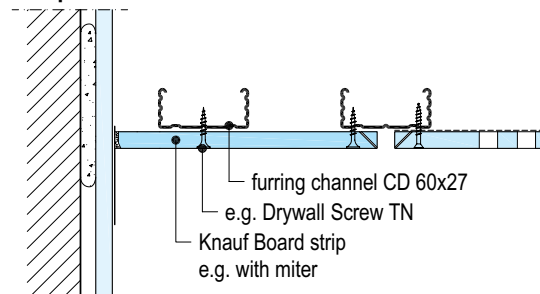
• options



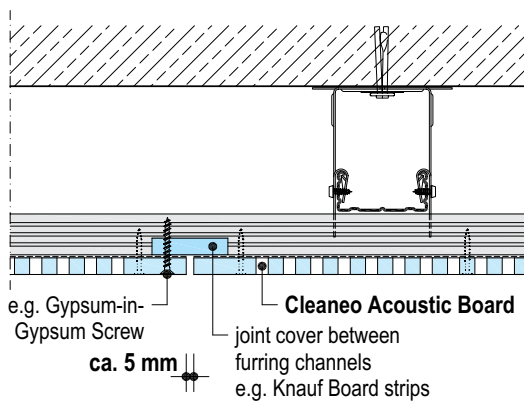
D127-D2 Frieze with exposed joint



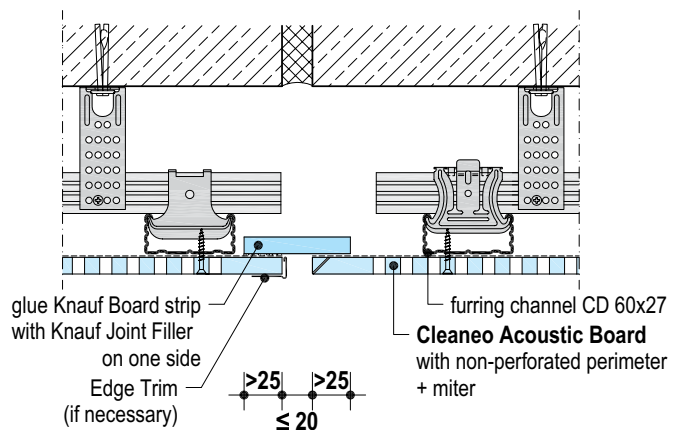
• option



D127-SO12 Control joints, long edge



D127-SO13 Settlement joints



D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

Spacings of Substructure / Details



Suspended ceiling, belonging to fire resistance class on its own

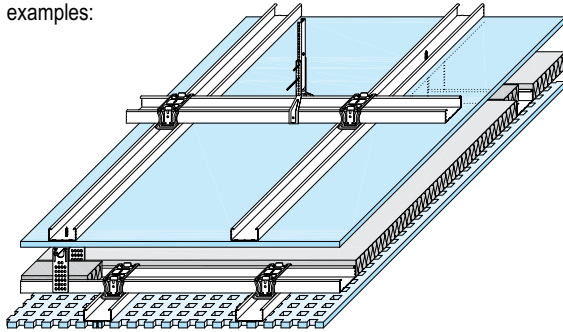
F30 • solely from below / • solely from below and from above (plenum)

Proof: ABP P-3400/4965

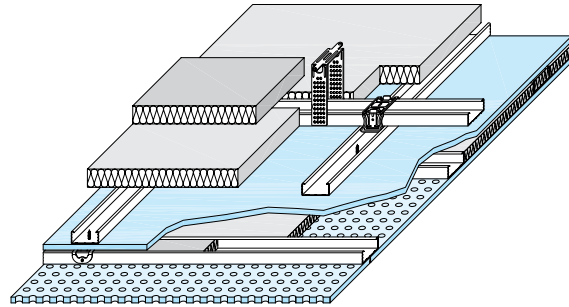
for fire stress from below: no fire protection requirements to basic ceiling / roof construction

for fire stress from below or from above: basic ceiling should be of the same fire protection class as the suspended ceiling

examples:



- solely from below
2nd grid level fastened with Universal Bracket, double grid



- solely from below and from above
2nd grid level fastened with Direct Bracket, single grid

1st Grid level, max. spacings

all dimensions in mm

Spacing of carrying channels	Spacing of suspenders	Spacing of furring channels
• solely from below 1000	650	400
• solely from below and from above 850		

2nd Grid level, max. spacings

all dimensions in mm

Spacing of carrying channels	Spacing of suspenders	Spacing of furring channels ^b
• fastened with Direct Bracket, single grid	800	max. 333.5
-		
• fastened with Universal Bracket, double grid	800	max. 333.5
800		

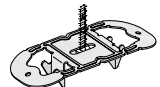
Spacing of furring channels depending on perforation (s. pages 2+3)

Install suspended channels of 2nd grid level always laterally to furring channels of 1st grid level

2nd Grid level, fastening

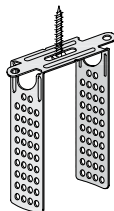
Direct Bracket
for CD 60x27

Bend
side tabs



Universal Bracket
for CD 60x27

Cut or bend according to
required
installation height



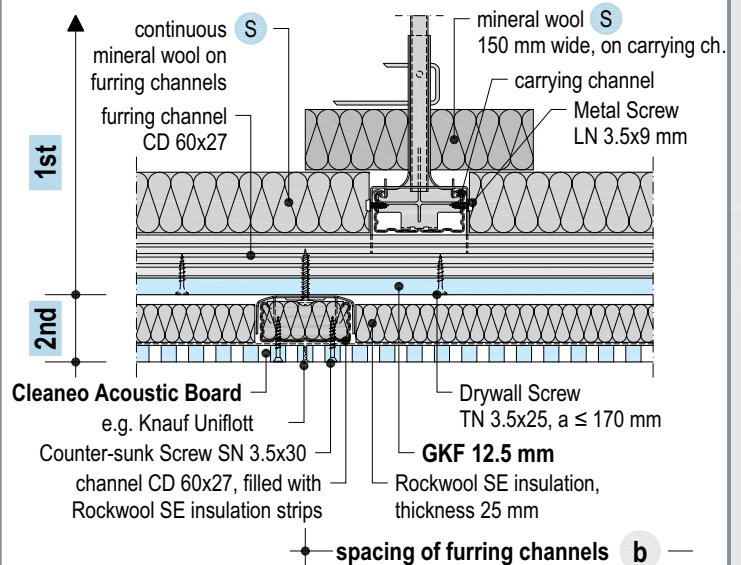
- Fasten alternating to every second furring channel of 1st grid level with Knauf All Purpose Screws FN 4.3x35 (according to ABP P-VHT-1802/05-FN)
- Max. load of 100 N per fastening of the 2nd grid level

Mineral wool insulation acc. to DIN EN 13162, chapter 3.1.1

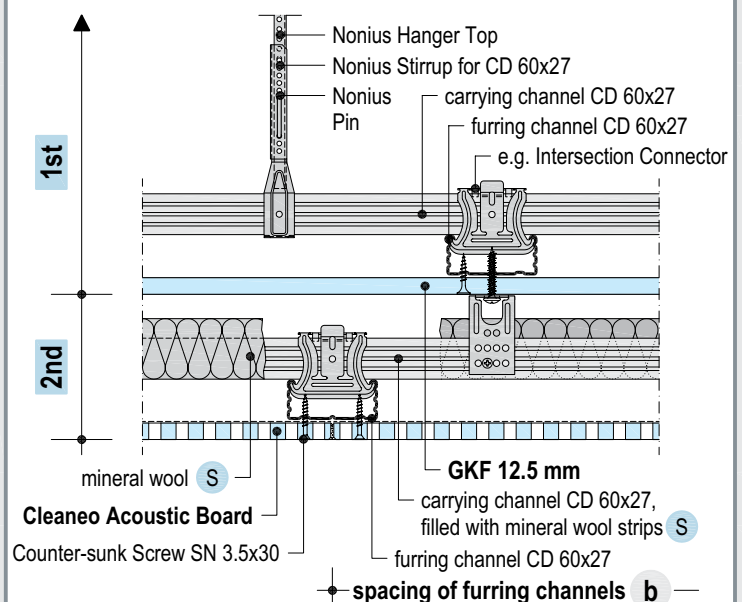
- S** building material class A
melting point $\geq 1000^\circ\text{C}$
according to DIN 4102-17
- thickness 40 mm
density $\geq 40\text{ kg/m}^3$

Details scale 1:5

D124vuvo-C1 Front edge joint • solely from below and from above



D124vu-C1 Front edge joint • solely from below

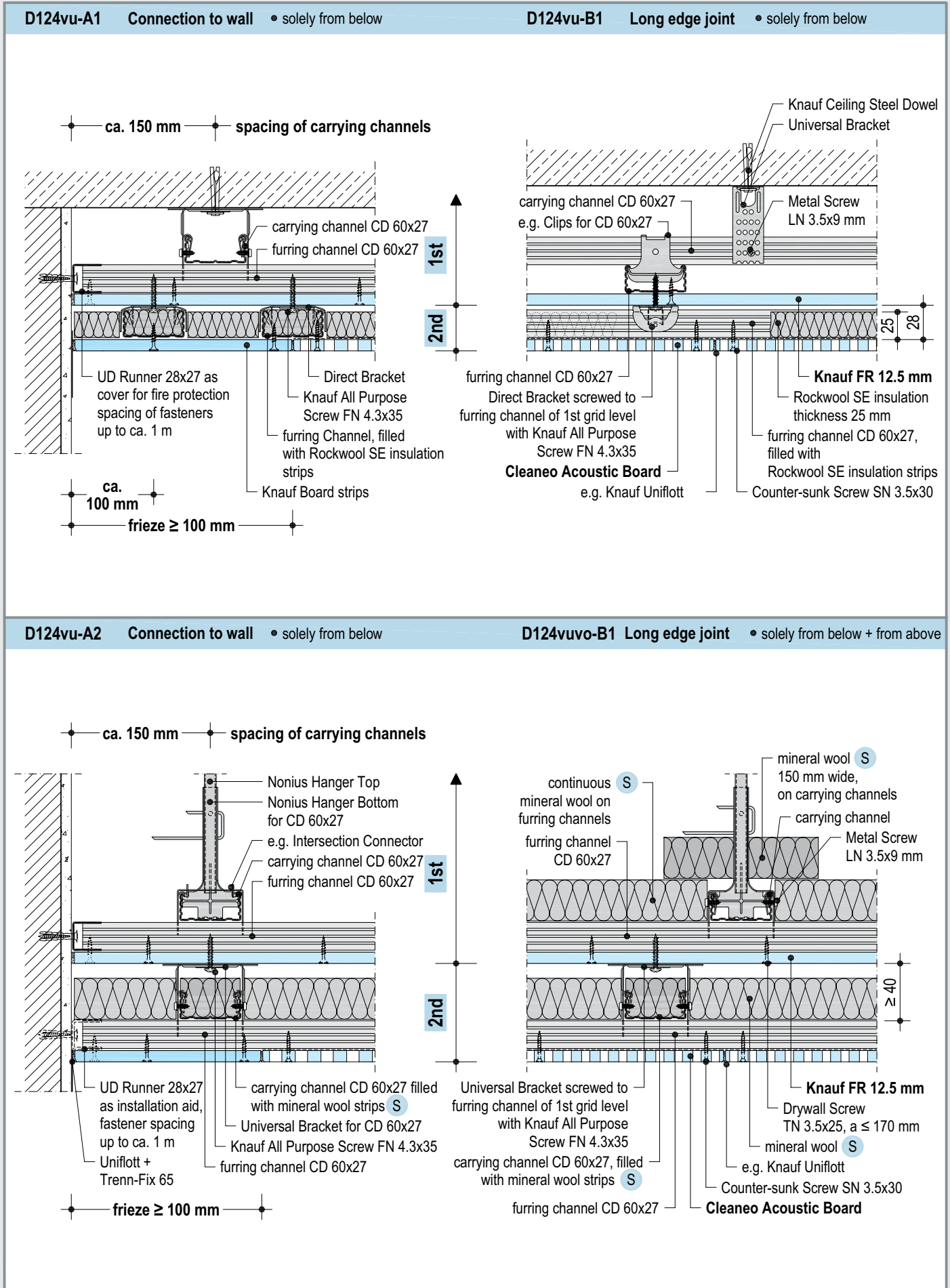


D124 Knauf Cleaneo Acoustic Fire Protection Ceiling

Details



Details scale 1:5

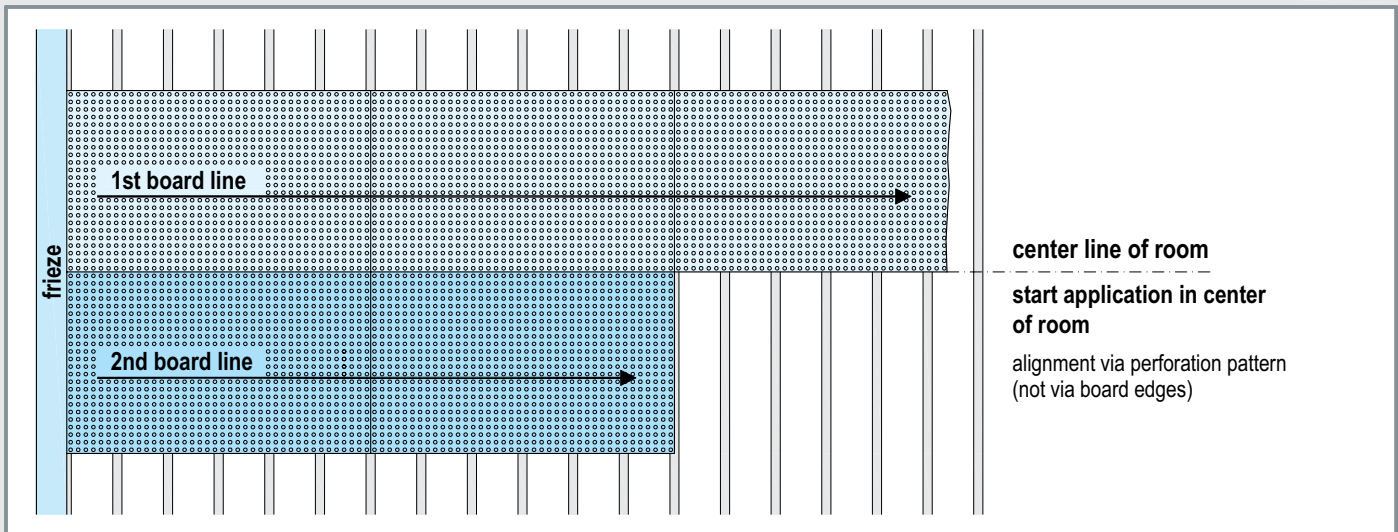


D12 Knauf Cleaneo Acoustic Ceilings

Application of Knauf Cleaneo Acoustic Boards

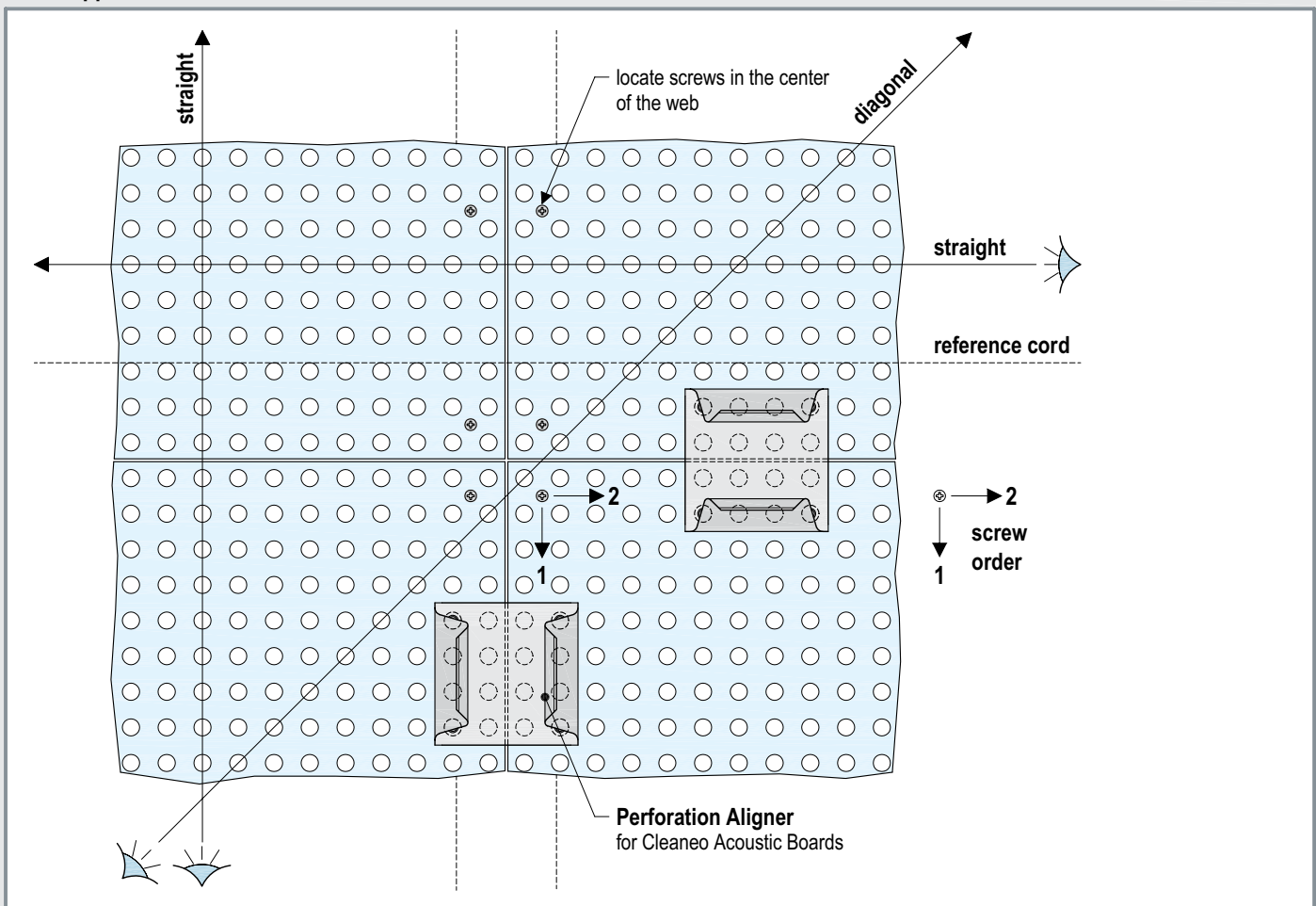
Sequence of application

scheme drawing



Board application

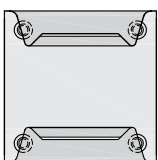
scheme drawing



Notes

- Check overall appearance of the ceiling constantly by alignment via the straights and diagonals of the perforation rows
- Cleaneo Acoustic Boards are applied with cross joints
Cleaneo Acoustic Boards with standard and alternating perforation patterns are color-coded in red and blue along the front and long edges. Place red board markings adjacent to blue marking along front and long edges during installation.
- The Perforation Aligner is only meant for checking perforation spacing during installation.

Perforation Aligner for Cleaneo Acoustic Boards



available for perforations:

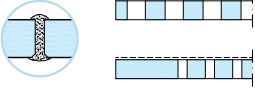
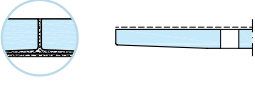
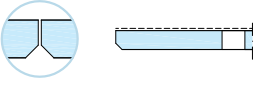
6/18 R, 8/18 R, 10/23 R, 12/25 R, 15/30 R, 8/12/50 R, 12/20/66 R

D12 Knauf Cleaneo Acoustic Ceilings

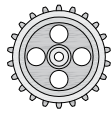
Jointing / Application / Attachment of Knauf Boards



Edge types, joint filling and application

Edge type	Filling compound Uniflott	Fugenfüller / F2F	Frieze
4SK 4-side square edge 	Bevel face side edges of Cleaneo Acoustic Board with Sanding Mesh Prime edges with Knauf Tiefengrund primer Align boards via perforation pattern Fill joints fully with Knauf Joint Filler	Unsuitable	made of non-perforated board strips Bevel cut edges of board strips (SK) on face side with Sanding Mesh Prime cut edges with Knauf Tiefengrund primer Apply boards with 3 to 4 mm joint width Fill joints fully with Knauf Joint Filler
4AK 4-side tapered edge 	Butt-joint board edges Apply joint tape while filling the joints	Butt-joint board edges Apply joint tape while filling the joints	Use board strips with tapered long edge (AK) Butt-joint board edges Fill with Knauf Uniflott / Fugenfüller / F2F and Joint Tape
FK 45° beveled edge (factory made) 	45° beveled edge (factory made) Butt-joint board edges Visible joint		Bevel board strips to 45°

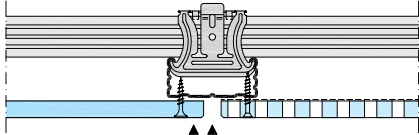
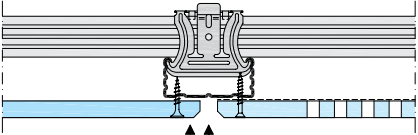
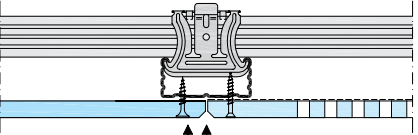
Pilot Wheel



To clean perforations after hardening of the filling compound
 Available for perforations:
 6/18 R, 8/18 R, 10/23 R, 12/25 R, 15/30 R
 (order handle separately)

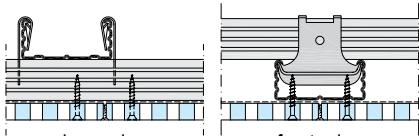
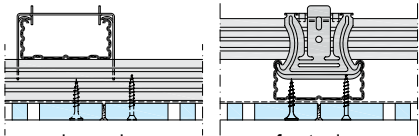
Frieze, unfilled

scheme drawings

• Frieze, front edge 4SK	• Frieze, front edge FK	• Frieze, front edge FK
 frieze board strip bevel edge with Sanding Mesh exposed joint Cleaneo Acoustic Board bevel edge with Sanding Mesh, channel coated with color of fleece (on site) shadow gap ca. 10 mm	 frieze bevel board strip with Beveller to 45° exposed joint channel coated with color of fleece (on site) shadow gap ca. 10 mm	 frieze bevel board strip with Beveller to 45° exposed joint

Attachment of Knauf Boards

• spacing of screws 170 mm

• Perforation pattern: SN 3.5x30	• non-perforated perimeter: TN 3.5x25 or SN 3.5x30
 long edge front edge	 long edge front edge

D12 Knauf Cleaneo Acoustic Ceilings

Consumption of Material of selected examples



Consumption of material per m² ceiling without allowance for loss and cut-off.

Amounts refer to ceiling area of: 10 m x 10 m = 100 m²

Description <i>italic = not provided by Knauf</i>	Unit	Amount as average value	
		D127	D124
connection to wall			
UD Runner 28x27x0.6; length 3 m	m	as required	0.8
<i>fastener approved for substrate</i> e.g. Knauf Ceiling Steel Dowel for reinforced concrete	pcs	as required	0.8
substructure			
alt. Knauf Ceiling Steel Dowel (for reinforced concrete) <i>approved fastener</i>	pcs	1.3	1.9
Universal Bracket for CD 60x27	pcs	1.3	1.9
Metal Screws 2x LN 3.5x9 mm (fastening to CD Channel)	pcs	2.6	3.8
or Nonius Hanger Top		1.3	1.9
Nonius Pin		1.3	1.9
Nonius Hanger Bottom for CD 60x27		1.3	1.9
Metal Screws 2x LN 3.5x9 mm (fastening to CD Channel)	pcs	-	3.8
alt. Nonius Stirrup for CD 60x27		1.3	1.9
Metal Screws 2x LN 3.5x9 mm (fastening to CD Channel)		1.3	1.9
		-	-
Knauf All Purpose Screw FN 4.3x35 2nd grid level	pcs	-	2
Universal Bracket for CD 60x27 2nd grid level	pcs	-	2
Metal Screws 2x LN 3.5x9 mm (fastening to CD Channel)	pcs	-	4
CD Channel 60x27x0.6; length 4 m	m	4.3	8.3
Multi-Connector for CD 60x27 (as longitudinal connection for CD Channels)	pcs	0.9	1.7
alt. Intersection Connector for CD 60x27	pcs	3.7	7.5
2x Clip for CD 60x27		7.4	15
<i>mineral wool (regard fire protection specifications, see page 21)</i>	m ²	as required	2.2
cladding			
Knauf Cleaneo Acoustic Board, 12.5 mm; with Standard Fleece black or white	m ²	1	1
Knauf Fire-Resistant Board GKF, 12.5 mm		-	1
Knauf Screws; (fastening of cladding)			
Counter-sunk Screw SN 3.5x30 mm (Cleaneo Acoustic Board)		23	23
Drywall Screw TN 3.5x25 mm (GKF) and (U-type Encasement)	pcs	-	20
jointing			
filling compound e.g. Uniflott, Fugenfüller or F2F	kg	as required *)	as required *)
Joint Tape	m	as required	as required

*) filling compound and consumption depending on edge type of boards (see also page 24)

Due to the number of alternatives the following criteria were assumed for the determination of the consumption:

D127: spacing of furring channels 333.3 mm, spacing of suspenders 1000 mm, spacing of carrying channels 900 mm
D124: spacing of furring channels 333.3 mm, 2nd grid level with Universal Bracket, fire protection from below and from above

D12 Knauf Cleaneo Acoustic Ceilings

Specifications



Item	Description	No. of units	Unit price	Total price
.....	Knauf Cleaneo Acoustic Design Ceiling D127 Ceiling lining / suspended ceiling* DIN 18168-1, installation height in m, suspension height in cm,* sound absorption coefficient according to DIN EN ISO 11654 $\alpha_w =$,* anchored on reinforced concrete, spacing in cm/ steel girder, type, spacing in cm,* installation with carrying channels and furring channels, suspended with Universal Bracket/ Nonius suspension *, cladding made of perforated/ slotted * gypsum boards DIN 18180 Knauf Cleaneo Acoustic with air-cleaning effect, thickness 12.5 mm, installation DIN 18181, single layer, <i>Standard Perforation:</i> Standard Circular R: 6/18 R/ 8/18 R/ 10/23 R/ 12/25 R/ 15/30 R */ Standard Square Q: 8/18 Q/ 12/25 Q */ <i>Alternating Perforation:</i> Alternating Circular R: 8/12/50 R/ 12/20/66 R */ Random PLUS R: 8/15/20 R/ 12/20/35 R */ <i>Block Perforation:</i> Standard Circular R: 8/18 R/ 12/25 R/ *, as Block Perforation: type B4/ B5/ B6 */ Standard Square Q: 12/25 Q/ *, as Block Perforation: type B4/ B5/ B6 */ <i>Block Slots:</i> „slotline“ as Block Slots: type B4/ B5/ B6 *, lamination on back with Knauf Standard Fleece, color: white/ black/ *, joint treatment: filling with Knauf Uniflott / Fugenfuller*/ F2F* insulation made of mineral wool according to DIN EN 13162, thickness 20 mm. * Product/ System: Knauf Cleaneo Acoustic Design Ceiling D127 m ² AED / QR / BHD AED / QR / BHD			
.....	Knauf Cleaneo Acoustic Fire Protection Ceiling D124 Ceiling lining / suspended ceiling DIN 18168-1, installation height in m, suspension height in cm,* fire resistance class according to DIN 4102-2 F30*, for suspended ceiling solely resistant to fire from below for protecting the basic ceiling and the plenum, */ for suspended ceiling solely resistant to fire from the plenum and from below for protecting the room lying below, the basic ceiling and the plenum *,* sound absorption coefficient according to DIN EN ISO 11654 $\alpha_w =$,* anchored on reinforced concrete spacing in cm/ steel girder, type, spacing in cm,* installation of 1st grid level with carrying channels and furring channels, suspended with Universal Bracket/ Nonius suspension *, cladding made of Knauf Fire-Resistant Boards FR, thickness 12.5 mm, insulation applied above furring channels plus 15 cm wide insulation strip on carrying channels made of mineral wool min. 40 mm, density $\geq 40 \text{ kg/m}^3$, melting point $\geq 1000^\circ\text{C}$ (1832°F)*, installation of 2nd grid level with furring channels only/ carrying channels and furring channels *, suspended with Direct Bracket/ Universal Bracket * on furring channels of 1st grid level, cavity damping with mineral wool, min. 25 mm Rockwool Floorrock SE or equivalent */ min. 40 mm, density $\geq 40 \text{ kg/m}^3$, melting point $\geq 1000^\circ\text{C}$ (1832°F) *, fill channels/ carrying channels * with mineral wool, cladding made of perforated/ slotted * gypsum boards DIN 18180 Knauf Cleaneo Acoustic with air-cleaning effect, thickness 12.5 mm, installation DIN 18181, single layer, with perforation Standard Circular R: 8/18 R/ 15/30 R */ Alternating Circular R: 12/20/66 R */ Standard Square Q: 12/25 Q */ Random PLUS R: 12/20/35 R */ *, lamination on back with Knauf Standard Fleece, color: white/ black/ *, joint treatment: filling with Uniflott / Fugenfuller*/ F2F* Product/ System: Knauf Cleaneo Acoustic Fire Protection Ceiling D124 m ² AED / QR / BHD AED / QR / BHD			
* Cancel not applicable items				Sub-total AED / QR / BHD

D12 Knauf Cleaneo Acoustic Ceilings

Construction, Edge Types, Planning



Construction

General

- Knauf Cleaneo Acoustic Boards are lined with Knauf Standard Fleece (white or black), or special acoustical fleece on request. Other colors on request.
- The sound absorption diagrams of individual Knauf Cleaneo Acoustic Boards show values that are only valid in connection with Knauf Standard Fleece linings.
- Knauf Cleaneo Acoustic Boards are perforated or slotted gypsum boards based on gypsum and zeolite, ideal for rooms to improve room climate and reduce air pollution.
- Loads directly anchored to Knauf Cleaneo Acoustic Boards are not permissible.
- Random PLUS: Certain view points in a room or unfavorable lighting may lead to a diminished visual impression of a continuous perforation pattern caused by longitudinal joints.
- Depending on the direction of the light, a looming of the furring channels can occur in connection with white Knauf Standard Fleece and perforations with diameter ≥ 10 mm.
- Separate gypsum boards from building elements made with materials other than gypsum, especially columns, by creating control joints that allow for movement, e.g. shadow gap.
- Settlement joints have to be transferred into the construction of the ceiling System.
- Use control joints in the case of ceiling areas over approx. 15 m length, or for narrow ceiling spaces caused by a break of a wall. For strongly structured suspended ceilings, additional control joints may become necessary.

- Knauf profiles are delivered galvanized. This corrosion protective coating is sufficient for indoor rooms, including bathrooms and kitchens in residential housing.

Knauf Cleaneo Acoustic Design Ceiling D127

- Knauf Cleaneo Acoustic Ceilings are anchored directly to the basic ceiling as a ceiling lining, or with suspenders as suspended ceiling.
- Knauf Boards are attached to a metal grid of carrying channels and furring channels.
- Mineral wool mats with a minimal thickness of 20 mm can be placed on the furring channels.

Knauf Cleaneo Acoustic

Fire Protection Ceiling D124

- Knauf Cleaneo Acoustic Fire Protection Ceilings as suspended ceilings consist of fire protection level and acoustic level.
- Fire protection F30 solely from below, or alternatively solely from below and from above, is provided. The installation of Knauf access panels is possible.
- The fire protection level is anchored on the basic ceiling with Universal Brackets or Nonius suspension. Knauf Fire-Resistant Boards FR according to DIN 18180 / EN520 are screwed on a metal grid of carrying channels and furring channels CD 60x27 according to DIN 18182-1.
- The acoustical level is attached with Direct Brackets or Universal Brackets to the furring channels of the fire protection level.

Knauf Cleaneo Acoustic Boards are attached to a metal grid made of furring channels only or made of carrying channels and furring channels CD 60x27.

Edge types

Knauf Cleaneo Acoustic Boards with continuous perforation

Knauf Cleaneo Acoustic Boards with continuous perforation patterns are delivered with square 4 sides (4SK) edges, dimensions as shown in the lists, 2 to 3 mm smaller than specified.

Knauf Cleaneo Acoustic Boards with Block Perforation type B4/ B5/ B6

Knauf Cleaneo Acoustic Boards with Block Perforation are available as 4-side square edge (4SK)

type, and with perforations 12/25 R and 12/25 Q additionally with 4-side tapered edge (4AK) type.

Knauf Cleaneo Acoustic Boards with Block Slots "slotline" type B4/ B5/ B6

Long edges: HRK (half-rounded edge), front edges: factory beveled (SFK), 4-side square edge (4SK) and 4-side tapered edge (4AK) on request.

Knauf Cleaneo Acoustic Boards with non-perforated perimeter

- 1-side to 4-side non-perforated perimeter as specified
- cut 4-side square edge (4SK)
- 4-side non-perforated perimeter, with bevel (4FK)
- 1-side to 4-side with bevel (FK) at non-perforated perimeters
- 4-side non-perforated perimeter as specified and with 4-side tapered edge (4AK)

Specifications for planning

- Perforation type: Standard Circular R/ Alternating Circular R/ Random PLUS R/ Standard Square Q/ Block Perforation/ Block Slots
- Separations (e.g. as exposed joints) within one room, especially when designing segments with continuous perforation.
- Fire resistance: F30 solely from below, F30 solely from below and from above.
- Color of fleece: white / black / other.
- Perimeter: non-perforated perimeters with width specifications according to page 4.
- Design of perimeter in room with/ without shadow gap, specified width.

D12 Knauf Cleaneo Acoustic Ceilings

Application, Jointing, Surface Treatment



Grid

Knauf Cleaneo Acoustic Design Ceiling D127

Suspended with Nonius Top, Universal Bracket, Nonius Hanger Bottom or Nonius Stirrup.

Reinforced concrete: Knauf Ceiling Steel Dowel
Other building materials: anchors have to be permitted and standardized for the building material being used.

Connect carrying channels CD 60x27 with hangers and align them at the required suspension height. Connect furring channels CD 60x27 to carrying channels with Intersection Connectors or Clips for CD 60x27; spacing depending on perforation pattern, 333.5 mm max.

Cleaneo Acoustic Fire Protection Ceiling D124

Fire protection level: Suspended with Universal Brackets or Nonius suspension spaced at 650 mm max. Spacing of carrying channels and furring channels according to tables on pages 2,3 and 21

For fire protection from above apply an additional layer of mineral wool, building material class A, density $\geq 40 \text{ kg/m}^3$, melting point $\geq 1000^\circ\text{C}$ (1832°F), $t \geq 40 \text{ mm}$ above furring channels and a min. 15 cm wide mineral wool strip on carrying channels.

Acoustic level: Suspended with Direct Bracket (single grid) or Universal Bracket (double grid). Max. load per suspension point: 100 N. Spacings of channels and suspenders according to tables on pages 2,3 and 21.

Apply mineral wool, building material class A, density $\geq 40 \text{ kg/m}^3$, melting point $\geq 1000^\circ\text{C}$ (1832°F), $t \geq 40 \text{ mm}$ for grid fastened with Universal Bracket or $t \geq 25 \text{ mm}$ Rockwool for single grid fastened with Direct Bracket along the entire ceiling area.

- Single grid (only one level of parallel channels): fill channels with mineral wool strips and apply mineral wool fully between channels.
- Double grid (consisting of carrying channels and furring channels): fill carrying channels with mineral wool strips and apply mineral wool fully above furring channels.

Cladding

Knauf Cleaneo Acoustic Design Ceiling D127/ Cleaneo Acoustic Fire Protection Ceiling D124

Cross-mounting of Knauf Cleaneo Acoustic Boards (joint width 2 to 4 mm, depending on perforation pattern) laterally to furring channels, place front edge joints on channels. Sand down the face side square edges (SK) slightly with Sanding Mesh before installing the boards.

Knauf Cleaneo Acoustic Boards with standard or alternating perforation are color-coded in red and blue along the edges. Place red marking adjacent to blue marking along front and long edges. An installation team with 3 workers is recommended.

Align Knauf Cleaneo Acoustic Boards using laser equipment or reference cord regarding continuous straight perforation rows beyond joints in diagonals and lateral as well as longitudinal direction.

Use Perforation Aligner with knobs compatible to perforation pattern to check correct joint width (this does not replace aligning). Start fastening of Knauf Cleaneo Acoustic Boards either in the middle or at a corner in order to prevent upsetting deformation. Press the boards firmly on to the grid during screw attachment. Fastening according to table on page 24.

A seamless, non-perforated frieze with a minimum

width of 100 mm is recommended for irregular or non-rectangular layouts of ceilings.

Jointing

Hand fill joints with Knauf Uniflott without using tape on 4SK boards. Use Fugenfüller / F2F and tape on 4AK boards. Cover all screw heads as well. Knauf Cleaneo Acoustic Boards: prime before jointing.

Fill joints with Knauf Uniflott using the tube of the installation set, skim with Knauf F2F in a second run. Possibly filled perforations can be cleaned using a Pilot Wheel compatible to perforation pattern before hardening of filling compound.

Filling and covering of joints should only take place after the boards have been allowed to rest in the given humidity and temperature zones, and no more longitudinal changes can be expected, i.e. expansion or contraction. Joints should be filled at a minimum temperature of 10°C (50°F). In case of mastic asphalt screed, fill in joints after screed has been applied.

Surface Treatment

Before applying paints or coats the filled surface should be dust-free. Use a primer on Knauf Cleaneo Acoustic Boards before coating or painting them. Ensure that the primer and the coat or paint are compatible.

The following coats can be used on Knauf Cleaneo Acoustic Boards:

- **Coats:** Resin dispersion paints, multicolored (rainbow) emulsion, oil paint, matte-finish lacquer, alkyd resin paint, polymer resin paint, PUR lacquer, or epoxy-based lacquer, according to intended use or as required.
- **Alkaline coats** such as lime, water glass paints and silicate-based paints are unsuitable for gypsum board surfaces.

- **Silicate-based emulsion paints** may be used after referring to the manufacturer's recommendations and following the stipulated guidelines closely.

Notes

If Knauf Cleaneo Acoustic Boards are coated with diffusion open coats like dispersion paint, their air-cleaning effect will only be marginally reduced.

Gypsum board surfaces that have constantly been exposed to light without any protection can cause yellowing after coating. Therefore, a trial coat is recommended that will extend across several boards including all joints. Yellowing can, however, be successfully avoided only by using a special primer.